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**PUTTING IT IN CONTEXT:  
NEGATIVE OVERGENERALISATIONS IN DEPRESSION**

**Natalie Martine Jacoby**  
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Thesis submitted for  
The degree of Doctor of Philosophy

June 2007

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## **ABSTRACT**

This thesis explores the characteristics, role and manipulation of negative overgeneralisations in depression. The empirical studies conducted as part of this thesis set out to fulfil three main objectives: firstly, to investigate whether overgenerality to positive and negative cue words is a function of the autobiographical memory test (AMT) itself, rather than an accurate representation of memory recall in depression. The second objective was to explore the mechanism proposed in Brewin's dual representation theory (DRT; 1989). A sad mood induction procedure followed by a scrambled sentences paradigm were used to investigate whether reducing access to generalised negative situationally accessible memories, by encouraging participants to consider their mood within a broader context, could reduce the effects of negative primes on despondent mood. Thirdly, building on the previous objective of using contextual information to reduce despondency, a training paradigm was developed to assess whether currently-dysphoric participants' despondent mood could be reduced by inducing a contextual interpretation bias. In line with prediction, data suggest that overgeneral thinking in response to positive cue words may be an artefact of the AMT, or of a particular style of thinking induced by experimental tasks rather than a stable characteristic of depression. In relation to the second and third objectives, findings were mixed and limited support for Brewin's DRT found. Successful reduction of despondency using tasks that encourage participants to consider contextual information about negative events was confounded by several limitations. Limitations of the methods employed are discussed and the implications of the findings in relation to current research are considered. The incorporation of contextual training tasks, after further development, in to therapy for depression is suggested.

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## CHAPTER 1

### LITERATURE REVIEW

#### *1.1 Defining depression*

The term “depression” can be used to describe a broad range of emotions, from feeling temporarily “low”, to describing a chronic clinical disorder with potentially suicidal effects. It is common for people to experience temporary periods of a decrease in mood, but it is when these periods are prolonged that depressive disorder may be developing. In line with the broad spectrum of meanings of “depression”, there are four general domains into which symptoms fall, leading to enormous variation in the experience of depression from person to person. These four general domains are affect, cognition, behaviour and physical functioning; all of which relate to different types of symptoms.

Affective symptoms are those directly related to mood, or more specifically, the “*manifestation of abnormal affect*” (Hammen, 2002). This includes feelings of sadness, feeling down or empty, and often, feeling irritable. A common manifestation is lack of motivation or interest to do things that were once enjoyable, accompanied by loss of pleasure from these things. This apathy affects relationships, work and social interactions, with the depressed person unable to actively relieve their depression; even if the person is able to achieve a particular task, little satisfaction or fulfilment is experienced.

Affective symptoms could be summarised as all being “negative”, a term which also applies to cognitive symptoms. Cognitive symptoms are those related to the way a person is thinking, with thoughts about themselves, their future and their world typically being negative. The depressed have a low self-esteem, feel incompetent and worthless, and often feeling guilty that they are dwelling on their supposed inadequacies. Strong cognitions of hopelessness, with regards to resolving problems and managing their lives often result in despair, and in some cases, thoughts of suicide. In addition to pessimistic thinking, cognitive symptoms also include deficits in mental processes, such as poor concentration, decision making and memory, some of which are due to an inability to distract one from one’s negative thinking.

The presence of affective and cognitive symptoms subsequently impacts behaviour, often resulting in withdrawal from social activities and the desire to stay in bed for prolonged periods. Movements and speech may be slowed and lack animation, or may be restless and agitated. Psychomotor slowing is often related to “pure” depression, whereas restlessness is more common in person’s experiencing comorbid anxiety. Physical symptoms such as changes in appetite, sleep and energy also often manifest themselves. Appetite and sleeping patterns could either increase or decrease, and often correspond with each other, and a lack of energy is commonly experienced.

In accordance with the variety of symptoms, there are a number of forms of depression. These disorders either fall into the category of unipolar or bipolar depression. Bipolar disorder consists of periods of depression and mania or hypomania, which are episodes of abnormal *elevations* of activity level, self-esteem

and mood. The depressed phase of bipolar disorder is often indistinguishable from that in unipolar disorder. Bipolar depression is marked both by cycles of extreme mood swings, and in some cases, delusions and hallucinations. This thesis focuses on unipolar depression, which takes one of three forms: major depressive disorder (MDD), dysthymic disorder, or “depression not otherwise specified”.

MDD involves the persistent occurrence of at least five of the types of symptoms described above, for a minimum of two weeks, with at least one of the symptoms being depressed mood or loss of interest or pleasure. The exact diagnostic criteria for depression are defined in the Diagnostic and Statistical Manual (DSM-IV; American Psychiatric Association, 1994. See table 1.1). Dysthymic disorder often has milder symptoms than MDD, but symptoms must be chronic, persisting for at least two years (although there may be a period of normal mood lasting up to two months during this time). Dysthymia is particularly severe if it occurs before the age of 21-years-old and is termed “early onset” dysthymia. Furthermore, “double depression” can occur when an episode of MDD is superimposed on dysthymia. “Depression not otherwise specified” encompasses those disorders that have symptoms which do not fit the criteria for MDD or dysthymia. Examples of this include premenstrual dysphoric disorder, which is associated with the menstrual cycle; minor depressive disorder, which involves at least two weeks of fewer than five of the symptoms required for MDD; and recurrent brief depression, which involves brief periods of depression lasting between two days and two weeks, at least once a month for at least one year.

**Table 1.1:** Diagnostic criteria for major depressive disorder from the DSM-IV

<b>Major depressive disorder</b>	
Five or more of the following symptoms during the same 2-week period; at least one of the symptoms in depressed mood or loss of interest of pleasure.	
i)	Depressed mood most of the day, nearly every day (as indicated by subjective report or observation by others). Note: in children and adolescents, can be irritable mood.
ii)	Markedly diminished interest of pleasure in all or almost all activities most of the day, nearly every day (as indicated by subjective account or observation by others)
iii)	Significant weight loss when not dieting or weight gain (e.g. a change of more than 5% body weight in a month), or decrease or increase in appetite nearly every day. Note: in children consider failure to make expected weight gains.
iv)	Insomnia or hypersomnia nearly every day.
v)	Psychomotor agitation or retardation nearly every day (observable by others).
vi)	Fatigue or loss of energy nearly every day.
vii)	Feelings of worthlessness or excessive or inappropriate guilt nearly every day.
viii)	Diminished ability to think or concentrate, or indecisiveness, nearly every day (either subjective or observed by others).
ix)	Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

Depression affects adults and children of all ages and from all countries. Various surveys have been carried out to establish the current rates of depression across different countries: in Europe, Smith and Weissman (1992) found rates to be between 4.6% and 7.4%; the National Comorbidity Study surveyed all the US states, and found

a rate of 4.9% amongst 15 to 54-year-olds. Such surveys suggest that at any one time approximately 1 person in 20 is clinically depressed.

The variability, severity and occurrence of depression have meant that this is a disorder that has received much scientific interest. Models within the different approaches of psychology have been developed to try and explain the development, maintenance and treatment of depression. This thesis takes a cognitive approach in its research of depression. As such, this chapter will discuss the traditional cognitive theories of depression, followed by a closer look at the characteristic processes observed in depression, with a focus on overgeneral memory. The limitations of using traditional cognitive theories to account for depression will be discussed, and the possible advantages of using multi-level models suggested. The multi-level, dual representation theory (DRT; Brewin, 1989) will be discussed in relation to depression, and directions for future research proposed. Finally, the literature investigating the effects of interpretive bias training on mood change will be reviewed. This chapter will end by summarising areas for future research in the literature and presenting the aims of the thesis.

### ***1.2 Cognitive theories of depression***

Beck's (1967, 1976) cognitive model continues to be one of the most influential and researched models of depression. It has stood the test of time over nearly 40 years, receiving support from a steady flow of studies. Beck's initial formulation of this theory was based on the verbalisations of patients undergoing psychoanalysis with him. He noticed that much of the negative affect experienced by patients was related to



automatic, unconscious thoughts, which were generally formed around negative views of present, past and future experiences. Beck noted that “depressive thinking” was characterised by a number of errors including abstraction, overgeneralization, dichotomous thinking, and exaggeration.

Such errors result in a form of depressive thinking characterised by a strong negative bias towards the outcome of all events, which Beck (1991) suggests is predictive of all subtypes of depression. Beck (1991) described this thinking as a “negative cognitive shift”, postulating a change in one’s cognitive organisation, where by positive self-relevant information is blocked and negative self-relevant information is admitted. This cognitive shift is governed by absolute beliefs formed early in life (e.g. after repeated experiences of rejection). Beliefs, or “cognitive schema” such as “I am worthless” and “I can’t do anything right” are used to interpret any experiences pertinent to self-worth, ability or social desirability. As the patient will have a bias towards only remembering negative outcomes of a situation, negative schemas are reinforced and retained, and positive outcomes ignored. Therefore, a depressive episode could be triggered by a particular life experience imposing on these schemas, particularly if that situation reminds the person of the circumstances in which the original negative view was acquired (Hammen, 2002).

A related central theme of Beck’s cognitive theory is the cognitive triad of depression. Depressed patients tend to think more negatively (due to the accessibility of negative schema) about *themselves*, *their world*, and *their future*. Beck et al. (1979) suggest that these concepts of the self, world and future can be used to describe depressive thinking

both individually and collectively. Common automatic attributions to this triad see the self as defective, the world as defeating and the future as fruitless. Therefore, in the same way that negative schema are formed, they are repeatedly associated to the self, world and future.

A second cognitive theory of depression, which is primarily built on Beck's cognitive model, but incorporates aspects of hopelessness theory, is Teasdale's (1988) differential activation hypothesis (DAH). Cognitive theory suggests that negative self-schemas act as a diathesis to developing depression when triggered by a significant life event (Beck et al., 1979). Implicit in this, is the existence of different cognitive schema in those vulnerable and not vulnerable to depression. However, investigations of depressogenic schema using the dysfunctional attitudes scale (DAS; Weissman & Beck, 1978) between recovered depressed participants, who are susceptible to depression, and controls, have failed to find differences in DAS scores (e.g. Hamilton & Abramson, 1983; Silverman, Silverman & Eardley, 1984; Simons, Garfield, & Murphey, 1984). Teasdale's DAH accounts for these results by suggesting that "vulnerability to severe and persistent depression is powerfully related to differences in patterns of thinking that are activated *in the depressed state*" (Teasdale, 1988: p. 251). Consistent with Beck's cognitive model, Teasdale suggests that depression is maintained by negative interpretations of one's experiences, but that depressed mood activates particular memory representations which determine the nature of these interpretations. Patterns of processing established in initial episodes of depressed mood will form an association between negative thinking patterns and depressed mood. A positive feedback loop between depressed mood and cognitive processing is then

established whereby negative thinking patterns are re-activated by subsequent depressed mood, irrelevant of the cause. Information attended to is then further influenced by these thinking patterns, which influences interpretations of the experience, and reinforces negative thinking patterns. If only mild negative constructs are activated depressed mood will not persist. However, as also suggested by Beck, depressed mood is exacerbated if an experience is evaluated as uncontrollable, or highly aversive, or if global, self-relevant, negative constructs about oneself (e.g. worthlessness) are activated.

The third cognitive theory of depression to be discussed in this review is that of learned helplessness (Seligman, 1975), which attributes negative erroneous expectations of the outcome of events to the development of depression. The theory was originally based on Seligman's (1975) observation of the learned helplessness developed by animals when continuously exposed to unavoidable aversive stimuli. In relation to depression, Seligman suggested that helplessness develops from a failure to take action when people believe that the outcomes of events are out of their control, making it impossible to avoid undesirable outcomes and obtain desired ones. Abramson, Seligman and Teasdale refined this model in 1978, linking depression to the interpretation of negative events as being caused by unchanging and pervasive aspects of the self. They suggested that depression was likely to develop if negative feelings are interpreted as unchanging over time ("stable") and events ("global"). Conversely, if unstable and specific interpretations of feelings and events are given, suggesting that feelings and events do change, depression is unlikely to develop.

The theory was further modified by Abramson, Metalsky and Alloy (1989) to include a subtype of depression called *hopelessness* depression. Hopelessness theory suggests hopelessness is a *cause*, rather than a symptom of hopelessness depression. Hopelessness depression was purposed to result from a chain of distal causes (causes operating near the beginning of the chain) and proximal causes (causes operating towards the end of the chain), culminating to a proximal sufficient cause, hopelessness, which guarantees the occurrence of the symptoms of depression. Abramson et al. defined hopelessness as “*an expectation that highly desired outcomes will not occur or that highly aversive outcomes will occur coupled with an expectation that no response in one’s repertoire will change the likelihood of occurrence of these outcomes*”. This definition may sound similar to the original helplessness theory, which places an emphasis on negative expectations to the development of depression; however the subtle difference lies in the differentiation between helplessness as a symptom, and hopelessness as a cause of depression. Therefore, the fundamentals of the proximal sufficient cause are: (1) the expectancy of negative outcomes, and (2) a helplessness expectancy, feeling unable to change these outcomes (making helplessness a component of hopelessness). The contribution of stable and global interpretations to hopelessness depression is also retained by this modified theory.

Comparison of the three cognitive theories highlights two underlying similarities. They all emphasise the role of maladaptive thinking and overgeneralisation of negative attributions to subsequent experiences. Secondly, they all suggest that these thinking patterns are based on a stressful event/string of events, teaching the application of negative expectations, i.e. diathesis-stress components are present in all. Similarly

several differences that exist between them, the most obvious of which is that hopelessness theory distinguishes a subtype of depression, whilst cognitive theory and DAH do not. Beck's theory concentrates on discrepancies in depressive thinking only, whereas hopelessness theory talks about depressive and non-depressive thinking. For example, hopelessness theory suggests that non-depressive thinking can also have distorted cognitions; hopelessness theory also states that unstable and specific attributions to the causes of experiences represent an invulnerability factor for depressive symptoms. Similarly, DAH differentiates between more mild and severe constructs, with depressed mood less likely to be maintained by mild negative constructs. The extent to which cognitions are described and recognized as a cause of depression varies between the theories. Whereas Beck concentrates on the role of cognitions in the aetiology, maintenance and treatment of depression, Abramson et al. also recognises the role of the environment to this. In contrast to Abramson et al. and Beck's theories, DAH presents depressed mood itself as necessary for the activation of negative cognitions.

Beck's (1976) model and the Abramson et al.'s (1989) hopelessness theory of depression remain two of the most widely researched, and have significantly influenced cognitive behavioural therapy for depression. Although other cognitive theories have been developed to account for depression (e.g. Rehm's self-control model, 1977; Nezu's problem-solving model, 1987) these will not be discussed in this review as the research presented primarily investigates concepts presented in cognitive theory and hopelessness theory. Evident from the descriptions of cognitive and hopelessness theories is the impact of negative thinking in maintaining depression.

However, a number of concepts are not explored in detail by Beck and Abramson et al. Although Beck recognises overgeneralisations as an error of thinking in depression, and Abramson et al. suggest that hopelessness develops from negative generalised stable and global attributions, overgenerality in depression is not explored in detail. Overgeneral memory (OGM) is a characteristic of depression that has received much investigation. Consistent with the detrimental effects of overgeneral attributions about the self and events (Beck, 1964; Abramson et al., 1989), OGM has also been linked to outcome of depression (e.g., Brittlebank, Scott, Williams, & Ferrier, 1993). Other prominent processes of depression that have been linked to OGM are intrusive memories and rumination. To improve our understanding of and treatment for depression, it is important to further investigate these processes. The next section will discuss the literature concerning OGM, intrusive memory and rumination, and their links to Beck's cognitive theory and Abramson et al.'s hopelessness theory of depression. As a central feature of this thesis, the focus will be on OGM and its links to intrusive memory and rumination.

### **1.3 Cognitive processes in depression:**

#### ***1.3.1 Overgeneral memory***

Overgeneral autobiographical memories (OGMs) are those referring to people, places or activities lasting longer than one day or not referring to a specific time period (*extended*), and events that happened repeatedly (*categoric*) (Williams et al., 2007). Williams and Broadbent (1986) first recorded OGM recall in their study of suicide attempters using the autobiographical memory test (AMT). Sixteen patients who met criteria for MDD were compared to two control groups; one from the hospital pool to

control for any confounding hospital effects, and a group from a psychology pool. Participants were presented with five pleasant and five unpleasant cue words and asked to give a specific memory related to each word. Response latencies of the suicide attempters were significantly slower than both control groups for pleasant, but not unpleasant cue words. The suicide attempters group also produced significantly more general memories than both control groups in response to pleasant and unpleasant cue words. This study demonstrates both a bias in access to negative memories, and the tendency for depressed patients to retrieve general rather than specific memories.

Since Williams and Broadbent's findings the propensity of depressed patients to produce OGMs in response to cue words has consistently been found. However, findings regarding OGM recall to positive and negative cue words differs between studies. For example, Williams and Dritschel (1988) and Williams and Scott (1988) found that in comparison to control participants, depressed patients tended to be more overgeneral in response to positive cue words on the AMT. Brewin, Reynolds and Tata (1999) and Goddard et al. (1996) found that depressed patients recalled OGMs to positive and negative cue words. Conversely, Jones et al. (1999) found patients to produce more OGMs to negative cues.

van Vreeswijk and de Wilde (2004) carried out a meta-analysis of 14 AMT studies investigating the role of depression in autobiographical memory specificity. All the studies showed that in comparison to normal controls, depressed patients responded with less specific memories to cue words. However, as touched on above, effects of cue valence on specificity varied between studies. Similarly, response latency to

positive and negative cues showed inconsistency across studies. For example, Williams & Scott (1988) found depressed patients took longer to respond to positive than negative cues, whereas controls were slower to respond to negative cues. Conversely, Scott et al. (2000) found no differences in response latency to positive compared to negative cues, or between patient and control subjects.

Prior to Williams and Broadbent's (1986) first record of OGM in suicide attempters, the concept of overgenerality was also proposed by Beck (1967), who observed that patients' thinking was characterised by overgeneralizations. Similarly, Abramson, Seligman and Teasdale (1978), and later, Abramson, Alloy and Metalsky (1989), suggested that depression was most likely to develop when individuals attributed negative events to unchanging and pervasive aspects of themselves and their environment. These predictions have been confirmed by studies showing that overgeneralization is one of the strongest markers of depressive thinking (Carver & Ganellen, 1983). Sweeny, Anderson and Bailey (1986) further suggest that global, generalized attributions for negative outcomes, and specific attributions for positive outcomes are associated with depression. Therefore, inherent in these theories and findings is the unlikely occurrence of positive overgeneral attributions by the depressed, as such interpretations would unlikely lead to a view of the self, world and future as worthless, disappointing and hopeless. Thus, in contrast to the AMT literature, both cognitive and hopelessness theories emphasise a relationship between depression and *negative* overgeneralisations of thoughts and events.



One possibility for this discrepancy is that generalised representations of multiple positive and negative events are more accessible than specific events. Williams et al. (2007) have suggested that this type of memory organization may act as a strategy to avoid specific unpleasant memories that are likely to have detrimental effects on mood. Alternatively, OGM retrieval in response to negative and positive cue words may occur due to features of the AMT or of a particular style of thinking that it encourages. An analytical thinking style, which involves “thinking about the self, about depression-related thoughts and feelings, and about how to understand what is going on” (Teasdale, 1999), has been found to be related to an increase in the recall of categoric memories on the AMT (Watkins & Teasdale, 2001; Crane, Barnhofer & Williams, 2007). It is possible that the AMT encourages an analytic thinking style, which may not be promoted by more naturalistic methods of eliciting memories. Therefore an interesting question for future research is whether recall of positive overgeneral memories by the depressed is observed in more naturalistic methods of memory recall, or whether it is specific to the AMT.

van Vreeswijk and de Wilde (2004) suggest several possible methodological differences in the administration of the AMT that could account for the different study outcomes. AMT characteristics found to moderate performance were the form in which the cues were presented, whether or not responses were audiotaped, and the amount of time given to respond. Due to the small number of studies considered, van Vreeswijk and de Wilde could only speculate possible reasons as to how such differences affect response: Lack of an audio recording of participants’ responses could be subject to experimenter bias in interpretation of memories; participants

required to respond in a given time may feel more pressured to think of a memory, and hence find it harder; cue words read by in how the words are read and defined, and/or in voice intonation which could imply more positive or negative meanings.

Williams, Healy and Ellis (1999) investigated the effect of cue imageability and predictability on memory specificity using the AMT. Data suggested that specific memory recall was facilitated by both cue-imagery, with specific memory access and latency facilitated by high-imageable cues and greater cue predictability. On further inspection of the data, Williams et al. suggested that imageability was a more significant predictor of memory specificity, likely due to the large amount of visual event specific knowledge associated with specific memories (Anderson & Conway, 1993). Therefore, a high-imageable cue is more likely to trigger a discriminable visual image. Consistent with these findings, Goddard et al. (1998) and Williams et al. (2006) both found that a concurrent cognitive load task with the AMT reduced memory specificity in response to low-imageable, but not high-imageable cues in a non-depressed sample.

The susceptibility of the AMT to methodological differences calls the ecological validity of this task in to question. Memory specificity should be further investigated using alternative tasks. This would shed light on whether OGM in response to cue words is a feature of task demands of the AMT, or whether AMT studies reflect the true nature of underlying memory representations.

Despite inconsistencies in the precise nature of OGMs, the recall of OGMs by the depressed is a robust finding. The reason why they occur will now be considered. One explanation draws on the hierarchical nature in which memories are encoded and retrieved. Hierarchical theories (e.g. Norman & Bobrow, 1979; Reiser et al., 1985) propose that a memory is represented by a combination of encoded descriptions, varying in their level of detail. When encoding everyday experiences, e.g. one's journey to work, if something distinctive occurs then that memory will be encoded with a specific 'tag'. If nothing distinctive happens, then that experience will be encoded under the general umbrella of 'journeys to work'. The more detail encoded with an event (positive or negative), the easier it is to retrieve that memory as there are more distinctive cues encoded with it. When recalling an event, non-specific information regarding the general context of the event is retrieved first. More specific information is then retrieved using these general descriptions along with mnemonic cues available at the time of retrieval.

Williams and Scott (1988) suggested that the difficulty by patients and people vulnerable to emotional disorders in recalling specific memories may be due to problems at both the encoding and retrieval stages. Firstly a possible tendency to under-encode distinctive details would make specific memories harder to retrieve as the memory may have been stored at a very general level. Secondly, when depressed, the number of mnemonic cues available in the immediate environment, particularly positive ones, will be limited. Lack of cues will make it harder to move through the hierarchy of memories. It is possible that as patients try to do so, the memory search is

aborted at the general level, preventing selection at the level of specificity necessary to respond appropriately to the given context (Williams et al., 2000).

Limited evidence to support a hierarchical mechanism in memory search motivated Williams, Chan, Crane and Barnhofer (2006) to carry out a series of five studies investigating this. Two aims of these studies were to investigate whether memories are stored according to the number of distinctive cues encoded with them; and to investigate whether retrieval is a 'staged' process, working through earlier stages with general representations to higher stages containing specific representations. Cognitive load and cue-word imageability were manipulated via administration of the AMT with a concurrent random button-pressing task.

Consistent with prediction, memory retrieval to low-imageable cue words was affected by cognitive load. Participants found it harder to retrieve specific memories and instead recalled categoric memories, which are at an earlier stage of the search process. Recall of general over specific memories did not occur when using high-imageable words. This supports Williams, Healey and Ellis (1999) who found that specific memories were more likely to be retrieved in response to highly-imageable cues, which tend to evoke a visual rather than verbal image of a specific cue and so facilitate memory retrieval. This provides evidence for the order in which memories are stored within the hierarchy, and reaffirms the importance of event detail when encoding an event in memory. The more detail encoded the easier it will be to recall the memory at a later date.

Williams et al. (2006) also predicted that performance on the button-pressing task would be affected by more effortful memory retrieval, with performance being poorer when asked to recall a specific memory that is at a later processing stage, than general memories which are higher up in the hierarchy. However, this was not found to be the case. Task performance remained stable across memory type (specific vs. general) and cue-imageability (high vs. low). Williams et al. suggested this may have been due to a “trade off” performance on the AMT, with participants expending less effort. Therefore, although some support for a hierarchical model of memory retrieval was found, not all results were consistent with this. Of importance when applying this research to the phenomenon of OGM in depression, is that Williams et al. did not use a clinical sample. For a better understanding of OGM in relation to depression, further studies that either induce depressive thinking or use patients need to be carried out.

An alternative explanation for OGM in depression is that patients who have undergone a traumatic event retrieve OGMs as a defensive cognitive style designed to restrict access to painful memories. This explanation was proposed by Kuyken and Brewin (1995) after finding that depressed female patients with a reported history of physical or sexual child abuse produced more OGMs to positive and negative cue words than women without such an abuse history. Interestingly, number of OGMs was also related to high levels of avoidance of spontaneous abuse memories over the previous week. Kuyken and Brewin’s findings were subsequently supported by Brewin et al. (1998). Depressed and nondepressed cancer patients were interviewed about their experiences of death and illness, and were asked to describe any corresponding spontaneous intrusive memories over the previous week. Participants also completed the AMT.

Data again showed that depressed patients retrieved more OGMs than nondepressed, and that number of OGMS correlated with intrusion and avoidance of distressing memories. Similarly, Raes, Hermans, Williams and Eelen (2006) found that reduced memory specificity was associated with a “repressive coping” style [a combination of low trait anxiety and high defensiveness as measured by the STAI-T (van der Ploeg, Defares, & Spielberger, 1980) and the Marlowe-Crowne Social desirability Scale (Crowne & Marlowe, 1964)]. This also suggests that patients may try to avoid specific memories in order to protect themselves from recalling distressing events.

In contrast to that implied by Beck and Abramson et al., both a hierarchical mechanism and an avoidance mechanism for retrieval of OGM can account for recall of negative and positive OGMs. This may be particularly true for the avoidance mechanism, where patients may try to retrieve overgeneral positive memories to avoid a specific negative one. Despite presenting plausible mechanisms for recall of positive OGMs, these accounts are still limited by cognitive theories. If depression develops from a tendency to interpret events and experiences using negative schema (Beck), or negative global and/or negative stable inferences (Abramson et al.), then the resulting memory hierarchy and accessible memories should also be negative in valence. Therefore whether recall of positive OGMs on the AMT accurately characterizes memory representations in depression is still questionable.

The exact relationship between intrusive memories and overgeneral memories is not determined from previous studies. Patients may try to avoid specific painful memories of distressing events, resulting in a generalisation of memories. Alternatively, retrieval

of OGMs may be due to an inability to follow task instructions due to a reduced working memory capacity. Patients may exert a lot of effort to try and avoid distressing intrusive memories, limiting the capacity available to focus on other tasks. Before exploring this possibility further, intrusive memories in depression will be discussed.

### ***1.32 Intrusive memories***

Unlike OGMs, intrusive memories (IMs) are of a *specific* traumatic or negative scene that has actually taken place. Such memories are spontaneous and retrieved involuntarily, often cued by the presence of stimuli related to the original memory. Kuyken and Brewin (1994) were the first to record the presence of IMs in depressed patients. Depressed women with a history of childhood sexual or physical abuse were interviewed about the occurrence and frequency of abuse-related IMs in the week prior to the interview. Eighty-six percent reported high levels of IMs and avoidance. Compared to women who did not report abuse, abused women experiencing IMs and avoidance were also significantly more depressed.

Brewin et al. (1996) replicated these findings with a sample of depressed men and women. Patients identified life events they had experienced from a list, of which 87% of patients reported any IMs of those events over the past week. Spenceley and Jerrom (1997) added further support to these findings. They included a group of non-depressed controls to investigate whether previous findings were due to concurrent personal factors (e.g. life stress) triggering the reported IMs rather than depression.

Consistent with previous research, intrusion and avoidance of childhood memories was significantly higher in depressed women than controls.

As not investigated in their previous study (Brewin et al., 1996), Brewin et al. (1998) investigated the cause-effect relationship between IMs and depression. Matched samples of depressed and non-depressed cancer patients were interviewed about past life events and the experience of any associated IMs over the past week. A quarter of participants reported IMs, with significantly more IMs reported by depressed than non-depressed patients. Depressed patients were also more likely to report that the IMs typically began with or were exacerbated by the onset of depression. However, it is important to note that not *all* depressed patients reported IMs, and that the presence of IMs was significantly and positively correlated with low levels of coping with cancer. After controlling for depression, number of IMs was positively associated with cognitive avoidance, more helplessness and hopelessness, anxious preoccupation, and fatalism. These results imply that IMs are caused by current life events and difficulties, rather than by depression itself.

Conversely, IMs do seem to be significant in determining the course of depression. Brewin, Reynolds and Tata (1999) followed-up 52 depressed patients over six months. At baseline, measures of depression, OGM, and presence and avoidance of IMs were taken. At follow-up, severity of depression, and levels of intrusion and avoidance were re-evaluated. After controlling for initial severity of depressive symptoms, depression at follow-up was not predicted by OGM, but was predicted by the amount of intrusion



and avoidance of stressful autobiographical memories, with a poorer outcome predicted by the most intrusive memories, requiring more effort to avoid them.

There are two possible explanations as to why IMs predict poorer course, both of which are related to OGM. One is that IMs occupy working memory capacity (WMC), hindering concentration and reducing one's ability to perform concurrent tasks relevant to recovery, such as retrieving autobiographical memories of specific past successes. In a series of studies by Dalgleish et al. (2007), it was shown that reduced WMC was associated with a difficulty in retrieving specific memories on the AMT. Eight studies were carried out; the first four showed a relationship between AMT performance and other executive capacity-dependent tasks that did not measure autobiographical memory, and were unrelated to emotion. For example, participants completed a number generation task, where they had to generate numbers that satisfied different task constraints (e.g. "a sequence of six numbers within the range two hundred and two up to five hundred and ninety-eight"). This task was deemed comparable to the AMT, as for both tasks, correct answers had to satisfy a number of constraints. Significant correlations between poor autobiographical memory specificity and reduced WMC were found. These results were found independent of depressed mood, suggesting that AMT performance is dependent on WMC. In support of this, Dalgleish et al. demonstrated that high BDI scores were associated with low OSPAN (Operation Span task) scores, a measure of WMC.

Studies six to eight altered the task parameters of the AMT to either increase or decrease the role of WMC. The AMT was altered in three ways. Firstly by

manipulating the content of the cue words, so that they either referred to events that routinely last longer or shorter than one day; secondly by increasing mental load (participants were asked to repeat a string of digits after retrieval of a memory); and thirdly by reversal of AMT instructions – participants had to avoid retrieving a specific memory and generate a categorical memory instead. These manipulations altered the direction and magnitude of the relationship between depressed mood and autobiographical memory specificity as would be predicted: specificity was reduced in response to long-duration cue words compared to short-duration words; increased mental load reduced specificity; and reversing AMT instructions resulted in a positive correlation between higher BDI scores and more *specific* memories. These results support the notion that the relationship between depressed mood and memory specificity is significantly driven by a reduction in WMC associated with depressed mood. Therefore if IMs occupy WMC, not only is it feasible that the link between course of depression and IM is via reduced WMC, but limited WMC could also account for OGM retrieval on the AMT.

Alternatively, rather than IMs themselves limiting WM, capacity may be affected by attempts to avoid IMs. As discussed in the OGM section, Kuyken and Brewin (1995) investigated the IMs of a sample of women with a history of childhood abuse. Higher levels of intrusion and avoidance of abuse-related memories were positively associated with OGM. This could either be due to IMs disrupting the memory search at an early level of retrieval, or because attempts to avoid these distressing IMs result in an avoidance of all specific memories. Although avoiding specific memories may appear to be an adaptive strategy to help regulate affect, effects can also be maladaptive.

Compared to non-abused and abused women with low intrusion and avoidance levels, high levels of intrusion and avoidance were associated with more severe levels of depression, suggesting detrimental effects of avoidance (Kuyken & Brewin, 1994).

Brewin et al. (1998) extended Kuyken and Brewin's initial findings by showing that OGM was associated with IMs in a sample of cancer patients, suggesting that avoidance of any IM, rather than just those related to abuse, can cause OGM. Adding to this, both depressed and non-depressed patients had received a diagnosis of cancer; hence all participants had experienced a similar stressful life event. This suggests that it is not the experience of a traumatic event itself that causes OGM, but the experience of IMs associated with the trauma. Brewin, Reynolds and Tata (1999) again found an association between OGM and greater levels of spontaneous IMs of stressful events, as did Wessel, Merckelback and Dekkers (2002). Wessel et al. reinforced the generalisability of previous findings by using participants whom had all been exposed to atrocities during World War II in Indonesia during their childhood. Twenty-five participants receiving treatment for various psychiatric conditions were compared to 15 healthy controls that had also lived in Indonesia during WW-II. This study demonstrates the possible contribution of IM to OGM retrieval in disorders other than depression, suggesting that it is not limited to depression. As with Brewin et al. (1998), Wessel et al.'s study reinforces that it is not the experience of trauma alone that causes OGM.

Contrary to the above findings, Henderson et al. (2002) did not find an association between IM and OGM. Female students with and without a reported history of

childhood sexual abuse completed the AMT and the impact of events scale (IES; Horowitz, Wilner, & Alvarez, 1979), which is the standard measure of intrusion and avoidance of specific memories. Although women who had experienced past abuse did recall fewer OGMs, this was not related to intrusion or avoidance of IMs. However, two key limitations of this study question the validity of their results. Firstly a self-report questionnaire version of the AMT was used. As discussed previously, AMT results are susceptible to methodological differences (van Vreeswijk & de Wilde, 2004). The mode of cue presentation and lack of time constraints in Henderson et al.'s study may have affected AMT results. Secondly, the sample had low IES scores, which could account for the lack of relationship between IM and OGM.

On first look, comparison of the findings from the aforementioned studies, as with the AMT and OGM literature, show some inconsistencies. Firstly, the relationship of OGM to IM intrusion versus avoidance shows discrepancies: Wessel et al. found lack of specificity to be related to both intrusion and avoidance; whereas Brewin et al. (1999) only found a relationship with intrusion; and Brewin et al. (1998), and Kuyken and Brewin (1995) found OGM to be associated with avoidance but not intrusion. Brewin et al. (1999) suggested that inconsistencies concerning relation of specificity to intrusion and avoidance of traumatic events may reflect unreliability of the IES. Secondly, whereas Brewin et al. (1998), Brewin et al. (1999), and Kuyken and Brewin (1995) found intrusion and avoidance to be related to lack of memory specificity in response to positive and negative cue words, Wessel et al. (2002) only found this to be the case in response to negative cue words. However, closer inspection of the correlations from Kuyken and Brewin's (1995), Brewin et al.'s (1998), and Brewin et

al.'s (1999) studies suggest that their findings were not that different. By averaging the correlations across the studies between OGM and intrusion (mean  $r = .25$ ) and OGM and avoidance (mean  $r = .24$ ), it can be seen that there are only minor differences rather than real discrepancies between the overall findings. Wessel et al. (2002) study analysed their data via regression and analyses, and Henderson et al. (2002) do not report the non-significant correlations, so are not included in the calculation of the means. Thus overall, OGM does appear to be related to both intrusion and avoidance.

Whether IMs influence OGM by limiting WM capacity, or through attempts to avoid IMs, a link between these processes is apparent. Similarly, OGM has been suggested to be linked to rumination, with rumination occupying attentional resources and increasing OGM. Williams (1996) suggests that depressive ruminative self-focus can decrease autobiographical memory specificity as patients are unable to distract themselves from their thoughts. The following section will describe rumination and its link to depression.

### ***1.33 Rumination***

Rumination can be broadly described as “persistent, recyclic, depressive thinking”, however its precise definition can vary according to the approach taken. Nolen-Hoeksema's (1991) response-styles theory of depression defines rumination as “behaviours and thoughts that focus one's attention on one's depressive symptoms and on the implications of those symptoms”. The theory proposes that when ruminating, people consistently entertain negative thoughts rather than focusing on ways to actively resolve the issues. Rumination is thought to have detrimental effects on

depression, exacerbating moderate symptoms through a persistent negative focus on them, leading to episodes of major depression.

Ruminative responses have been compared to non-ruminative, distracting responses, to show the prolonging effects of rumination on depression. Morrow and Nolen-Hoeksema (1990) compared the effects of different response styles on experimentally-induced depressed mood by asking participants to engage in either ruminative or distracting, and either active (aids distraction) or passive activities. Participants in the ruminative-passive condition silently read self-focusing, emotion-focusing, and self-questioning sentences. Sentences in the distractive-passive condition consisted of facts. In the active conditions, participants completed a card sorting task. Participants completing the ruminative-active condition sorted cards with positive and negative adjectives printed on them in to piles representing how well each adjective described them. The distractive-active sorting task contained cards with countries printed on them that had to be sorted according to the industrialization of those countries. Consistent with predictions, the distractive-active condition resulted in the greatest reduction in depressed mood, followed by distractive-passive, ruminative-active, and with the ruminative-passive condition showing the smallest remediation in depressive affect. Therefore degree of rumination has a greater effect on depressed mood than does activity. This study was replicated by Nolen-Hoeksema and Morrow (1991), using participants with naturally occurring depressed mood compared to non-depressed controls. Non-depressed participants' mood was not affected by either of the tasks; however depressed subjects in the ruminative condition showed a significant increase in depressed mood after the task compared to those in the distracting condition. Therefore, rumination itself does not necessarily lead to depressed mood, but existing

depressed mood can be prolonged through self-focused rumination; i.e., rumination represents a vulnerability factor to rather than a cause of depression.

Two mechanisms through which rumination can aggravate depressive symptoms that have received most attention are those related to the use of negative thoughts in making sense of current situations, and the effect of rumination on problem-solving skills. Nolen-Hoeksema (1991) suggests that an inability to solve problems related to one's sad mood may be impaired through interference by negative cognitions made accessible through rumination, and hence prolong depression. Using similar ruminative and distracting tasks to those by Morrow and Nolen-Hoeksema (1990), Morrow (1990) induced subjects in to a sad mood, then asked them to engage in either ruminative or distracting tasks, before being presented with life problems that they were asked to generate as many solutions to as possible. Participants in the ruminative condition produced half as many possible solutions compared to participants in the distracting condition.

The effect of negative ruminative thoughts of effective problems solving can be compared to the influence of negative schema on interpretations of situations proposed by Beck. Ruminating when in a depressed mood may lead individuals to have negatively-biased views of their problems. A negative focus on these problems may lead the individual to doubt their ability to solve the problems, interpreting them as more overwhelming, threatening, and less controllable, and believing that there are few solutions (Lyubomirsky et al., 1999). This is similar to the characteristics of hopelessness proposed by Abramson et al.(1989). In support of this, Lyubomirsky et al. (1999) showed that, through analysis of participants' thoughts in response to

ruminative and distracting tasks, although the initial aim of rumination was to look for reasons for their sad mood, attention was soon focused on their problems rather than solutions. Dysphoric participants who ruminated were more likely to view their problems as severe, uncontrollable, and therefore generate less effective solutions, than dysphorics in the distracting condition. Participants were also less likely to implement solutions, suggesting that rumination can affect several stages of the problem-solving process, supporting both response-styles theory and the role of hopelessness in the development of depression. Abramson et al. suggested that hopelessness, a cause of depression, develops when individuals develop the expectation that desired outcomes will not occur and aversive outcomes will, coupled with the expectation that there is nothing they can do change the outcome. This is similar to the unwillingness to try to solve problems, and the view that problems are severe and uncontrollable, displayed by Lyubomirsky et al.'s participants.

It has also been suggested that rumination may *facilitate* problem solving. Goal progress theory (Martin and Tesser, 1989, 1996) suggests that rumination occurs when clear, consistent feedback about an individual's progress is not received resulting in mental activities (such as working out alternative routes) designed to obtain this feedback. Rumination is said to occur when these mental activities are prolonged, and is meant to help individuals get back on track towards their goal. However, in line with response-styles theory, Martin and Tesser agree that although this may be the function of rumination, it does not always lead towards goal progression and is not always beneficial.



Watkins and Baracaia (2001) investigated the reasons why people ruminate by asking 61 self-identified ruminators. Qualitative and quantitative analyses revealed that high ruminators endorsed significantly more perceived benefits for rumination compared to low ruminators. Although nearly all ruminators admitted to serious disadvantages of rumination, at least one perceived benefit was also reported by 80% of participants. The most commonly reported benefits, particularly by high ruminators, were improved problem solving and increased understanding. These results are consistent with those of Lyubomirsky and Nolen-Hoeksema (1993), who showed that dysphoric and non-dysphoric participants whom took part in a rumination activity subsequently reported greater insight into their feelings and problems than participants who took part in a distraction task.

An alternative theory of rumination, which incorporates aspects of response-styles theory and goal progress theory is the Self-Regulatory Executive Function (S-REF) model of psychological disorder (Wells & Matthews, 1994, 1996). Rather than concentrating solely on the role of *rumination* in psychological disorders, as in the response-styles theory, the S-REF model focuses on the interaction between several cognitive constituents, including beliefs, metacognitions, attention, on-line processing, and self-regulation. The model consists of three interacting levels of cognition: a lower level, which predominantly functions outside of conscious awareness; an on-line S-REF level, which is involved in the conscious appraisal of events, and control of action and thought; and a self-beliefs store in long-term memory, which is relied on by the S-REF for on-line processing. The level most relevant to psychological disorder is the S-REF, which works to reduce self-discrepancies between the current self-status, and the

desired (normative) status using self-knowledge to guide coping responses. Although this works largely outside of conscious awareness, conscious thoughts can be influenced, for example declarative beliefs such as “worrying helps me cope”, can also manifest and guide attention (Wells, 2000). Like goal progress theory, the S-REF utilizes resources to formulate a plan to deal with the current self-discrepancy. However if the person is unable to achieve the self-regulatory goal, S-REF activity becomes persistent, leading to a repetitive focus on particular beliefs, i.e. rumination. This may arise through selection of an inappropriate coping strategy; unrealistic goals; or, as suggested in Beck’s cognitive theory, continual negative appraisal of the current status based on negative self-knowledge. Rumination then blocks adaptive S-REF activity by leading to further elaborate representations of negative beliefs and stressful events, making negative self-referent information more easily accessed. Thus, although S-REF activity in the form of rumination may initially be seen as a coping strategy, it can also have negative effects on emotional self-regulation.

Wells and Matthews (1994, 1996) suggest that individuals with positive beliefs about rumination may ruminate when in a depressed mood as a coping strategy. However, a lack of appropriate modifying information can activate negative beliefs, which can consequently lead to a “hopelessness” rather than “coping” ruminative strategy. Wells and Matthews therefore show how depression can be linked to positive or negative beliefs, or their interaction. The maintenance of depression is not only motivated by the need to achieve a normative state, but can also be affected by emotional state. For example, a depressed state could bias the retrieval of knowledge for processing to that associated with the depression only. This is similar to the ‘negative cognitive shift’

proposed by Beck (1991), which suggests a change in the cognitive organisation of the depressed, where by positive self-relevant information is blocked and negative-self relevant information is admitted. The consequence of such responses directly affects lower-level processes and behaviour, and the amount of resources available for other cognitive processes, most notably attention (Matthews & Wells, 1999).

Consistent with this, research has found several aspects in which attention is affected in depression. For example, rumination during S-REF activity has the effect of highlighting negative aspects of the person's experiences, leading to a bias for negative stimuli (also suggested by response-styles theory, the cognitive model of depression, and learned hopelessness theory). Rumination may also affect the amount of attention available for other tasks as evident from differences in performance on tasks requiring focused attention in depressed participants relative to controls. Lyubomirsky, Kasri and Zehm (2003) carried out three studies investigating the effects of dysphoric rumination compared to distraction on concentration on academic tasks (reading a passage, watching a lecture, proofreading a document). Compared to non-dysphorics, dysphoric ruminators found it the hardest to concentrate on each of the tasks; were slower in reading the passage and showed poorer reading strategies; were slower and showed less comprehension in answering questions about the lecture; and showed poor proofreading performance. As well as reporting difficulties in concentrating, dysphoric ruminators also reported interfering thoughts during the tasks. Lyubomirsky et al. agree that a possible mechanism for reduced concentration is through a lack of attentional resources, due to rumination forcing attention to be divided (and therefore concentration lost), leading to a reduction in the amount of information that can be

processed. Interestingly, the nondysphoric ruminators did not show impaired concentration on these tasks, implying that rumination in the absence of depressed mood does not have adverse consequences, and can be ignored.

Occupation of attentional resources by ruminative thoughts could also be another factor affecting performance on the AMT and hence OGM. Once again, if a person is distracted by ruminative thoughts, their ability to concentrate on a task may be hindered. Watkins, Teasdale and Williams (2000) investigated the effects of distraction compared to rumination on the recall of autobiographical memories. Dysphoric participants completed either a rumination or distraction task. The rumination task asked participants to focus their attention on symptom-, emotion-, and self-focused sentences (e.g. 'Think about the possible consequences of the way you feel'). In contrast, the distraction sentences were externally focused (e.g. 'Think about the shape of a large black umbrella'). Participants then completed the AMT and number of categorical memory responses was recorded. As predicted, rumination increase the number of overgeneral memory responses to cue words relative to distraction. These findings suggest that OGM can be manipulated and that it is affected by the processing style active during retrieval. Watkins et al's results supported those of Nolen-Hoeksema and Morrow (1993) who used the same rumination and distraction tasks. However, neither Watkins et al. nor Nolen-Hoeksema and Morrow used a clinical sample. This limitation was addressed by Watkins and Teasdale (2001). Thirty-six depressed participants either completed the same rumination or distraction task as used by Watkins et al. (2000). Results replicated previous studies, with rumination decreasing categorical memory recall and distraction increasing it. Park, Goodyer and Teasdale (2004) replicated these results in a group of adolescents with major

depressive disorder, again demonstrating that rumination compared to distraction increased recall of OGM to negative cue words. These studies indicate a role of rumination in increasing OGM, and also demonstrate that OGM recall can be manipulated through cognitive tasks.

### ***1.34 Cognitive processes summary***

Although OGM, IM and rumination are distinct cognitive processes contributing to depression, the characteristic negativity that is a defining feature of depression is prevalent in all of these processes. The negative content of ruminative thoughts, tendency of IMs to be of negative traumatic events, and the overgenerality of negative memories are all consistent with cognitive theories of depression. Both Beck (1967, 1976) and Abramson et al. (1989) emphasize the effects of negative life events on the content of cognitions and the subsequent role of these negative cognitions in the development of depression. In addition to and arising from this negative bias in thinking, overgeneralisations were noted by Beck as one of a number of thinking errors. Similarly, Abramson et al.'s hopelessness theory highlights the detrimental effects of making global and stable interpretations of negative events. Failure to contextualise the outcomes and meanings of similar events, can lead to hopelessness and hence depression. IMs may add to the damaging effects of negative overgeneralisations by spontaneously bringing memories of negative events to the patient's attention. Just like the thoughts and interpretations recognised in Beck's cognitive triad, and Abramson et al.'s global and stable interpretations, IMs may make general negative beliefs more credible and accessible to the patient by supporting these erroneous cognitions. Negative cognitions are again highlighted in relation to

rumination, which tends only to be destructive when associated with sad mood (Lyubomirsky, Kasri & Zehm, 2003). Furthermore, the self-focus component of rumination can be associated with learned helplessness theory and the cognitive schema in Beck's theory, all of which are oriented around negative, pervasive aspects of the self.

Another commonality within the cognitive processes literature is the role of conscious (or "controlled") versus unconscious (or "automatic") memory representations. Explanations of OGM, IM and rumination all suggest that these processes are a result of automatic representations. For example, OGM may maintain depression through the automatic access of negative general memories over positive ones; the spontaneous, involuntary retrieval of IMs make negative memories more accessible; and rumination occurs when a person is unable to distract themselves from processing self-referent information.

The role of automatic versus controlled processes is particularly relevant to OGM, and the relationship of OGM to IM and rumination. The automatic access of generalised memory representations may act as a defence-mechanism to avoid retrieval of specific, painful IMs. Similarly, OGM may be a by-product of rumination, with attentional resources being occupied by ruminative thoughts, resulting in the automatic retrieval of OGMs on tasks such as the AMT. The ability of the depressed to encode and retrieve specific memories is evident from the recall of specific IMs and the conscious appraisal of events via rumination. Yet the tendency to recall overgeneral memories, and the possible influence of IMs and rumination on OGM, suggests that there is more

than one type of memory store in operation. Similarly the occurrence of (for example) IMs by some depressed patients but not others (e.g. Brewin et al., 1998), suggests that there must be more than one route between memory and emotion.

The classic cognitive theories of depression, which present a single direct link between cognition and emotion, have provided a “neat” mechanism through cognition can lead to emotion. However, this mechanism can not account for multiple memory stores in relation to emotion. Furthermore, by presenting only one level of meaning that directly effects emotion, the distinction between “intellectual” or “rational” belief and “emotional” belief can not be drawn. The following section will describe multi-level theories of cognition and emotion, which attempt to distinguish between these two types of belief.

#### ***1.4 Multi-level models of depression***

Up to this point, the review has discussed depression and its processes in relation to Beck’s (1967, 1976) cognitive theory and Abramson et al.’s (1989) hopelessness theory, which view these processes as general problems of cognition. An alternative view is that taken by multi-level theories of depression. These models suggest that the same event can be represented at different levels, containing distinct information, which can have different effects on emotion. Whereas Beck’s and Abramson et al.’s theories suggest that the same memory representation of an event is used for all forms of processing of that event, multi-level models suggest that different levels of information are used. By suggesting that information is only represented at one level, Beck’s cognitive theory and hopelessness theory cannot account for the different

emotional responses people may have. For example, thinking about an emotional event, which may be rational and not lead to an emotional response, is different from experiencing an emotional event, which can trigger a strong emotional response. Multi-level models overcome this problem by suggesting that there are different levels of representation, some directly linked to emotion and others not. This section of the review will discuss three multi-level models of emotion: Brewin's dual representation theory (DRT, 1989); Barnard and Teasdale's interacting cognitive subsystems (ICS, 1991); and Power and Dalgleish's schematic, propositional, analogical and associative representation systems approach (SPAARS, 1997).

Brewin's DRT differentiates between two levels of memory representations: (1) verbally accessible memories (VAMs) and (2) situationally accessible memories (SAMs). VAMs are associated with a person's conscious experience of an event, and can be accessed and manipulated voluntarily. VAMs are used to interpret and classify the meaning of situations using information from long-term memory, and involve the processing of the context of situations. SAMs include the nonconscious summaries or syntheses of related past experiences, which do not contain contextual information. SAMs are triggered by physical features or meanings of a current event matching an original emotional event causing automatic activation of cognitive, emotional and behavioural representations.

Emotional memories can be encoded in both verbally and situationally accessible forms. The individual is unaware of what information will and won't be made consciously available, although inferences may be drawn from subsequent



recollections of the traumatic event and one's reaction to similar events. Unlike VAMs, there is no bidirectional flow of information between the original sensory input and SAMs. The bidirectional flow between sensory information and VAMs means that VAMs can influence the conscious representation of an experience, and it is through VAMs that individuals can think more rationally about an experience and their feelings towards it. SAMs cannot influence the conscious representation of an experience, but like VAMs, they can influence behavioural output. As such, when a person encounters a situation similar to that encoded in a SAM, automatic involuntary responses can be triggered. For example, when considering whether one would enjoy going on a holiday, one may access situational memories of a previous holiday which they did not enjoy, which in turn may lead to negative feelings about the current holiday, possibly leading to a negative mood. In relation to emotional disorders, the activation of a SAM may automatically trigger negative intrusive thoughts or images. This could activate further SAMs and contribute to the development and/or maintenance of an emotional disorder. In relation to the holiday example, the initial SAM may increase the accessibility of other negative thoughts and feelings surrounding other holidays, leading to increased negative mood and a dislike of all holidays in general. As such, SAMs can be likened to cognitive primes, with negative SAMs leading to negative interpretations of new situations that are similar to previous negative events (whether or not the new event is also negative).

Therefore, DRT presents two routes to emotion: A controlled route via VAMs, where the individual can rationally think about an event; and an automatic route via SAMs, which can lead to involuntary emotional responses. Disorders such as depression are

most likely to occur when the two routes deviate from each other, and SAMs cause involuntary emotional reactions that the individual cannot necessarily consciously explain. This could account for the ability of some patients to rationalise their depressive thoughts yet remain depressed.

Like DRT, ICS also presents separate memory subsystems for different information. When first developed by Barnard (1985), ICS could potentially be used to explain all aspects of information processing. Barnard and Teasdale (1991) later applied this model to cognition and emotion. An advantage of ICS over single level approaches is the recognition of the difference between intellectual and emotional beliefs. As suggested above, the lack of this distinction in models such as Beck's (1967) cognitive model cause them to become insufficient when a patient is able to rationalise their negative thinking patterns but remain depressed. ICS suggests there are two levels of meaning which, like VAMs and SAMs, play different roles in the production, maintenance and modification of emotion. The propositional level represents specific, intellectual meaning, based on truth that can be assessed. Information at the propositional level is not directly related to emotion and is not affected by sensory information such as arousal, tone of voice, or visual stimuli. The implicational level, like SAMs, recognises recurring patterns over different experiences and encodes these in the form of more generic, holistic representations, extracted from patterns of propositional codes, which correspond to emotional schematic models. Emotion is directly related to the implicational code, being generated through the processing of appropriate implicational code patterns. For example, depressed mood can result from the activation of depressive schematic models. The depressive schema will be based on

patterns of information extracted from various sources, including environmental events, and internal and external sensory input. Schemas can be triggered by subsequent meanings related to this information, resulting in a depressive emotional response (Teasdale, 1999). The propositional level can only indirectly add to emotion generation through the specific meanings contributing to depressive schema. Barnard (1985) suggested that information processing occurs through the interaction of these systems and information flowing between the systems. Teasdale and Barnard describe how this interaction between systems can lead to “depressive interlock”, which contributes to the maintenance of depression. Interlock occurs when both propositional and implicational output are centred round the same recurring themes (e.g. the self as useless/worthless/a failure), and so mutually reinforce each other (Teasdale & Barnard, 1993). Depressive interlock can be automatically triggered by any element related to the depressive schema (similar to the activation of SAMs by related stimuli). Thus, although like DRT, ICS presents intellectual (propositional) and emotional (implicational) levels of meaning, unlike DRT, ICS suggests that depression is only the result of automatic but not controlled processing.

Like DRT, the SPAARS approach suggests that emotion can be generated through both automatic and controlled routes. Power and Dalgleish (1997) present four levels of information representation in their model: an analogical level, a propositional level, a schematic level and an associative level, with the former two levels leading to emotion generation. The analogical level stores sensory and perceptual information, including visual, olfactory and auditory representations of a specific event. The propositional level, like the propositional level in ICS, encodes specific verbal

information about an event, such as what the person was thinking at the time, the sequence of events, and what the person did. The propositional level can contain automatic negative thoughts that can indirectly cause emotion by feeding appraisals to the schematic and associative levels. Unlike DRT, but consistent with ICS, SPAARS also presents a higher-order level of information representation, which encompasses models of the self, world and others. This schematic level incorporates many different aspects of information concerning a particular theme (such as “the self as useless”, or “the world as dangerous”), forming schematic models on which an individual’s sense of the self and world are based. This level also represents an individual’s goals, which aim to maintain dominant schematic models. Emotion can be directly and rationally generated through the schematic level via effortful appraisal of external and internal input. Therefore, like VAMs, the individual is consciously aware of the information processed and able to interpret it rationally. Incoming information is evaluated based on the schematic model active at the time. Therefore activation of depressive schema will lead to the evaluation of the self and current events as useless/failure/worthless.

The associative level represents the second, automatic, route to emotion generation. Unlike the schematic level, appraisal of current goals in relation to the present event is not required. Emotion generation at the associative level is based on associative-learning from past emotional responses, either through biologically “prepared” responses, such as phobias, or through repeated event-emotion pairings in the past (Daggleish, 1999). Emotion related to past event-emotion pairings can be involuntarily triggered by stimuli similar to those present in past events. This is similar to the activation of SAMs by related stimuli. Therefore, both DRT and SPAARS suggest that

depression can result via both controlled (VAMs/schematic model level) or automatic (SAMs/associative level) processing.

As stated previously, the main advantage of multi-level models comes from their ability to distinguish between different types of information represented at different levels of processing. This results in different explanations of the functional relationships between cognition and emotion; most importantly, the distinction between “intellectual, rational” thinking and “emotional” thinking. This distinction explains the ability of individuals to process different aspects of one topic, and provides an explanation for the ability of some depressed patients to rationalise their feelings yet still feel depressed. Ironically, the strength of multi-level theories is also their weakness. The number and complexity of relationships between cognition and emotion makes the formulation of testable hypotheses difficult. As suggested by Teasdale (1999), does the impenetrability of empirically testing the models imply that, rather than explaining cognition-emotion relationships, the diversity of the models simply provide an unconstrained framework with which to explain any given phenomenon.

The multiplicity of proposed routes between cognition and emotion is a particular limitation for the ICS and SPAARS approaches to cognition and emotion. DRT, however, manages to distinguish between rational and emotional thinking using just two distinct levels of processing, and focusing on the retrieval competition between them. DRT also provides a mechanism through which OGMs are formed and their role

in the maintenance of depression. The next section will provide a more detailed explanation of DRT and OGM.

### ***1.5 DRT and OGM***

The distinction between automatic and conscious processes is fundamental in understanding the link between information transmission and conscious experience. Brewin (1989) summarises automatic processes as those that are “*rapid, relatively inflexible, and difficult to modify; require minimal attention to occur; and may be activated without intention or awareness*”. Such processes often develop after repeated exposure to a particular stimulus. Conversely, conscious processing is deliberate, effortful, and easily modifiable and adaptable to new situations, although the processing capacity is limited by a person’s attention span. This means that conscious processes are susceptible to disruption by other stimuli competing for the person’s attention.

The interaction between automatic and controlled processing as a mediator of behaviour is elaborated in Brewin’s (1989) model. Controlled processing draws-on stored information in long-term memory, which is based on knowledge acquired (for example) through past experiences, books and socialisation. This information is referred to as “*verbally accessible knowledge*” or memories (VAMs), as it is thought to have been encoded in such a way that it can subsequently be made available when evaluating new situations. Despite the availability of VAMS, automatic responses, such as the impulse to flee, can still be activated by novel situations presenting threatening consequences.

Automatic physiological responses may or may not be consciously recognised. If responses such as a change in mood or heart rate are recognised, they may be encoded with the individual's conscious perceptions and interpretations of the situation. Physiological responses, such as fear, which are consciously activated and recognised by verbally accessible information, can often be rationally explained by the individual, attributing the response to their conscious beliefs. In contrast to this rationality, the irrational nature of some conditioned fears is based on a second type of knowledge in long-term memory called "*situationally accessible knowledge*" or memories (SAMs). This information relates to specific, emotionally charged, past experiences. SAMs are not consciously accessible, but are accessed when a similar event to the original is experienced (Brewin, 1989).

To reiterate what was said in the previous section, emotional/traumatic memories can be encoded in both verbally and situationally accessible forms. The individual is unaware of what information will and won't be made consciously available, although inferences may be drawn by subsequent recollections of the traumatic event and one's reaction to similar events. Unlike VAMs, there is no bidirectional flow of information between the original sensory input and SAMs. The bidirectional flow between sensory information and VAMs means that VAMs can influence the conscious representation of an experience, whereas SAMs cannot. However, both SAMs and VAMs can influence behavioural output. As such, when a person encounters a situation similar to that encoded in their SAM, automatic involuntary responses, including emotions, can be triggered.

Therefore DRT suggests that depressed mood can be automatically triggered through the activation of generalised negative thoughts or SAMs. Consistent with this, negative generalised schema (Beck, 1967), and negative global and stable attributions (Abramson et al., 1989) are characteristic of depression. Overgeneralisations by the depressed have also been consistently found in studies of autobiographical memory specificity (van Vreeswijk & de Wilde, 2004). The literature therefore suggests that overgeneralisations, particularly negative overgeneralisations, are detrimental to depression and should be a target of therapy.

Brewin (1989) has applied DRT to cognitive-behaviour therapy (CBT), which is a popular and widely used therapy for emotional disorders. CBT is designed to be a relatively brief therapy (approximately 20 sessions over 16 weeks; Beck et al., 1979), which focuses on current problems and dysfunctional thoughts and behaviours. Based on the cognitive theory assumption that depression is maintained by negative schema, Beck (1983) developed CBT to teach patients to address the negative cognitions dominating their interpretations of the world, self and future. Distorted conceptualizations and dysfunctional schema underlying patients' negative cognitions are identified, reality-tested and corrected using various cognitive and behavioural techniques. The patient learns to re-evaluate and correct their thinking, enabling them to act more realistically and adaptive in response to their psychological problems, leading to an improvement in symptoms. Brewin suggested that CBT could address interpretations and access of VAMs and SAMs respectively. This would equip patients with a more flexible approach to dealing with future events, rather than simply



addressing current problems and dysfunctional thoughts. Three suggestions for therapy were made: (1) Therapy could “*modify self-regulation in familiar situations*”, teaching patients strategies to prevent the access of threatening internal representations, giving the patient a sense of greater control. (2) Therapy could “*modify information about novel situations*”, preventing negative misinterpretations of the self in relation to VAMs. (3) Therapy could aim to “*modify access to nonconscious situational memories*”, either through changing the SAM itself/creating a new memory, by reducing access to negative SAMs, or by disrupting the feedback loop to prevent SAMs accessing further SAMs. It is this third potential aim of CBT that is relevant to the present thesis.

One way to reduce access to negative SAMs, and hence reduce negative generalisations, is to encourage individuals to consider the broader context in which negative moods and events can occur. This is particularly important in disorders such as depression and generalised anxiety disorder, where negative thoughts or fear become generalised to many situations. To combat this, patients must learn to discriminate between similar situations and recognise the specific features leading to a negative emotional response. Such specific features could be encoded into SAMs allowing participants to discriminate between different situations and prevent a generalised attribution of thoughts/feelings to all similar situations. For example, by encouraging participants to recall both positive and negative aspects of a situation, and using these perspectives to interpret the meaning of a situation, the likelihood of accessing negative SAMs will be reduced. Therefore, priming effects of a situation can potentially be reduced by broadening the context (the meaning, sensory and response

elements) of a situation (Brewin, 1989). However, the effects of modifying access to SAMs on mood, is still speculative as there is only limited research that has directly assessed this mechanism.

Watkins, Teasdale and Williams (2003) developed a paradigm to investigate whether the effects of a mood related cognitive prime can be reduced through increasing awareness of its contextual features. A scrambled-sentences task was used, where participants unscrambled a combination of negative self-referent Velten primes (Velten, 1968) and either contextual or control questions. The contextual questions were designed to make participants aware of the wider context of their current mood and minimised the priming effects of the Velten primes. Control questions were unrelated to mood. Watkins et al. monitored changes in despondent mood in a non-depressed sample that underwent a sad mood induction procedure at the beginning of the study. Consistent with prediction, the group who unscrambled the contextual questions showed a greater decrease in despondency after the scrambled-sentences task compared to the control group. Watkins et al. concluded that the meaning of a prime can be influenced by awareness of its context, which in turn can affect the memories accessed by participants in a despondent mood, therefore providing support for DRT.

Watkins et al.'s (2003) study provides preliminary evidence for the use of tasks that can affect despondency by teaching patients to think about their mood within a wider context. Successful replication of Watkins et al.'s finding would further support the development of such tasks for use with depressed patients. The manipulation of generalised interpretive biases of negative events to more contextualised

interpretations of these events could facilitate therapy for depression, providing additional methods to help patients overcome their tendency to attribute events to global and stable causes, as suggested by Abramson et al. (1989). The use of cognitive training tasks to manipulate interpretive biases in relation to anxious mood has been the focus of a growing body of recent research. The following section will discuss and evaluate this research, and make suggestions for the application of interpretive bias training methods to depressed mood.

### ***1.6 Training interpretive biases***

Negative experimentally-induced biases of ambiguous material have been demonstrated in both normal and anxious participants. For example, Grey and Matthews (2000) trained normal individuals to preferentially select either negative or neutral interpretations of ambiguous words. Participants were presented with a homograph (e.g. 'batter') followed by a homograph depicting either a negative or neutral meaning, e.g. 'ass--lt' (assault) or 'p-nc-ke' (pancake). Active completion of the word fragments on repeated trials lead to faster completions times on new task items of the same valence as previously trained. Richards and French (1992) also used ambiguous homographs in a lexical decision task. After being presented with a homograph, participants had to identify either negative or benign words associated with the homograph's meaning. Anxious participants reacted faster to the negative meaning.

The initial success of homograph training tasks lead to the development of more naturalistic tasks, which examined the generalisability of training to new tasks. Based

on a social situations paradigm used by Hirsch and Mathews (1997), Mathews and Mackintosh (2000) induced an interpretative bias using descriptions of social scenarios. Their experiments employed three phases (see Table 1.2 for example material for each phase from Mathews & Mackintosh, 2000). The first phase was the training phase, where participants read short descriptions of social situations, the meaning of which was disambiguated through completion of a final word fragment by participants. The valence of this fragment, either negative or positive, depended on the assigned training condition. To reinforce the training-congruent meaning, participants answered a comprehension question after each social scenario, which required participants to draw on the valence of the completed word fragment.

The second phase exposed participants to new ambiguous situations, to test whether the training-bias transferred to the new text. Once again, participants read a short description of a social situation and completed a word fragment at the end, followed by a comprehension question. Unlike in the training phase, both the word fragment and the question maintained the ambiguity of the situation. The interpretation of these situations was tested in the third phase via a recognition task. For each of the ambiguous situations, the similarity of four sentences to the situation was rated. Two of these sentences were 'targets', which closely matched the original passage in content, but disambiguated it giving it a positive versus negative meaning. The other two sentences were 'foils', which differed in meaning, but were also positive versus negative in valence.

**Table 1.2: Examples of material used by Mathews and Mackintosh (2000) to induce and test an interpretive bias**

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**Phase 1: Training**

Description of social situation

E.g. *Your partner asks you to go to an anniversary dinner that their company is holding. You have not met any of their work colleagues before. Getting ready to go, you think that the new people you will meet will find you (bo---g/fri----y).* [boring/friendly]

Participants completed the final word which determined the valence of the text. Participants were assigned to either predominantly negative or positive training trials.

Comprehension question

*Will you be disliked by your new acquaintances?*

<Yes/No> (Participants answered and received feedback as to whether correct or not).

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**Phase 2: Transfer of training bias**

New social situation and question – ambiguity remains

E.g. *Your friend asks you to give a speech at her wedding reception. You prepare some remarks and when the time comes, get to your feet. As you speak, you notice some people in the audience start to (l--gh).* [laugh]

*Did you stand up to speak?*

<Yes/No>

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**Phase 3: Recognition test**

Interpretations of the situations in phase 2 were tested by asking participants to rate the similarity of statements to the original they had previously seen.

E.g.

- (a) *As you speak, people in the audience laugh appreciatively.* [Positive interpretation]
  - (b) *As you speak, people in the audience find your efforts laughable.* [Negative interpretation]
  - (c) *As you speak, some people in the audience start to yawn.* [Negative foil]
  - (d) *As you speak, people in the audience applaud your comments.* [Positive foil]
-

An interpretative bias was suggested to be indicated by participants rating both the target sentence with the training-congruent valence as more similar than the target sentence with a training-incongruent valence. Generality to all training-congruent material was further demonstrated by rating the valence-congruent foil as more similar than the valence-incongruent foil. As predicted, Mathews and Mackintosh found significant training effects for both targets and foils.

Of further interest was the accompanying change in mood observed by Mathews and Mackintosh. Consistent with training-valence, anxiety significantly increased after training in the negative group, and showed a (nonsignificant) decrease after training in the positively-trained group. In a series of experiments, Yiend, Mackintosh and Mathews (2005) investigated the temporal characteristics of interpretative bias training. Using Mathews and Mackintosh's method, Yiend et al. looked at the durability of induced biases, the role of active versus passive training techniques, and the effects of training on anxiety. Experiments using active training (where participants had to complete the word fragment that disambiguated the training passage), demonstrated interpretation bias induction in non-anxious participants after delays of 20 minutes and at least 24 hours. The use of a passive training technique, where participants were presented with a completed word fragment at the end of the training passages, which they simply read, also demonstrated durable training induction after a 20 minute delay. These results suggest that both active and passive ambiguity training produce a robust interpretative bias.

The monitoring of mood across the different stages of all the experiments revealed more variation in the results. When active training techniques were used, significant increases in anxiety were seen after training in the negatively trained group, compared to the positively trained group who showed a decrease in anxiety. This was true for the study employing a 20 minute delay (although changes in anxiety were only significant cross the pre-training, post-training phases) but not for that employing a delay of 24 hours. The passive training experiment also did not yield training-congruent changes in anxiety. The finding that changes in anxiety were present with active generation but not passive reading supports the findings of Mathews and Mackintosh (2000). As suggested by Yiend et al., the need for active generation of solutions to affect mood, is consistent with the active nature of cognitive behavioural therapy, where optimum results are seen when patients actively participate. This implies that it is important to think about and process the meaning of the training material for mood to be affected. However, failure to replicate the training-congruent mood changes in the active generation form of the experiment with a 24 hour delay suggests that active generation is not the sole component necessary for mood change.

MacLeod et al. (2002) trained participants to either attend selectively towards or away from the space where negative words appear using a dot probe task. After training, participants were then exposed to an anagram stress task, which was designed to elicit a negative mood state. Data suggested that biased attentional responses to emotional words were successfully induced. In addition, mood ratings on analogue mood scales suggested that the induced attentional bias also affected participants' emotional response to the stressor task, with participants trained to attend to negative words

showing increases in depressed and anxious mood. MacLeod et al. suggested that the dot probe task influenced participants' emotional response to the stressor task by training them to either attend to or away from the most negative aspects of the anagram task, supporting the notion that emotional vulnerability is affected by cognitive biases.

Responses to stressful stimuli after training were further investigated by Wilson, MacLeod, Mathews, and Rutherford (2006). For the training stage of the experiment, participants were exposed to a homograph (e.g. 'tense') followed by a word fragment that participants had to complete, using the homograph as a clue. The word fragment completed by participants in the threat condition always gave a threatening meaning (e.g. 'anxious'), whereas those in the non-threat condition completed fragments with a non-threat meaning (e.g. 'future'). The interpretative assessment task that followed exposed all participants to equal numbers of threatening and non-threatening trials. Participants were again exposed to a prime word, but this time it was followed by two words: a target word coupled with a valence-matched foil. Participants had to indicate the position of the target word on the computer screen, which had a meaning associated with the prime. The final stage exposed participants to a video clip designed to elicit negative emotion. Anxious and depressed mood state was monitored throughout the study using visual analogue scales.

Wilson et al. found that an interpretive bias was successfully induced, with participants in the threat condition responding faster to threat associates of the ambiguous prime on the interpretative assessment task, and participants in the non-threat condition responding faster to non-threat associates. Analysis of mood scores showed no mood



changes immediately after the training condition compared to at the start of the study, but did show significant changes after the stressful video. Participants in the threat-training condition showed elevated anxiety scores (but not depression scores), whereas no significant differences in mood scores were observed in the non-threat group. Wilson et al. concluded that manipulation of interpretive bias can influence anxiety reactions to stressful stimuli.

Therefore the literature to date, consistent with cognitive models of emotion, suggests that cognitive biases can play a causal role in emotional reactivity. Successful manipulation of anxious mood by interpretive bias training has important implications for the development of tasks to reduce negative mood. However, these studies, although seminal in nature, do have some important limitations. The studies use student samples with no indication of naturally occurring anxiety or depression. The optimum training and testing conditions for eliciting mood changes is yet to be established, with findings being mixed: Mathews and Mackintosh (2000) and Yiend et al. (2005) have provided evidence of training-congruent mood changes directly after training, whereas MacLeod et al. (2002) and Wilson et al. (2006) did not find mood changes after training, but did find training-congruent mood changes after exposure to stressful stimuli. Effects on depressed mood are particularly sporadic. Only MacLeod et al. (2002) have successfully induced training-congruent changes in depressed mood, and this was when mean depression scores were combined with mean anxiety scores. Future research should add to this growing body of literature through the development of training tasks aimed at reducing, rather than increasing negative mood. Successful reduction of negative mood such as depression would shed light on the causal

cognitive mechanisms of depression, and have important implications for therapy. The ability of training tasks to manipulate naturally occurring negative mood, and hence to alter detrimental cognitive-biases in disorders such as depression will have far-reaching implications for developments in this area of research.

### ***1.7 Thesis focus***

Through-out the review several possible areas for future research have been identified. Firstly, an inconsistency exists, both within the AMT literature itself, and between the AMT literature and cognitive theories of depression (Beck, 1967; Abramson et al., 1989). Although OGM recall is a robust finding in dysphoric and depressed samples compared to normal samples, investigation of memory specificity to positively- and negatively-valenced cue words using the AMT has yielded mixed results. Adding to this is the discrepancy between the characteristic negativity in depression cited in cognitive theories, and the finding that OGM recall can occur in response to positively-valenced cue words. Beck's cognitive theory of depression proposes that the disorder is associated with generalized negative thoughts that arise from corresponding negative self-representations in memory. Similarly, Abramson et al. suggest that depression develops from hopelessness, which is the result of the generalised interpretation of negative (but not positive) events as being caused by unchanging and pervasive aspects of the self. Therefore, whereas AMT results have found overgeneralized memories recalled to *both* positive and negative cue words, cognitive theories of depression imply that depression is associated exclusively with *negative* generalized representations.

The first aim of this thesis is to investigate whether overgenerality to positive and negative cues words is a function of the AMT itself, rather than an accurate representation of memory recall in depression. The susceptibility of the AMT to procedural differences (van Vreeswijk & de Wilde, 2004) suggests that an alternative, more naturalistic method of investigating participants' memories needs to be developed. Such a task should not impose time constraints, be affected by experimenter differences, or take-up working memory capacity, as these are all factors that may affect memory recall. This thesis will investigate the positive and negative thoughts and memories of currently-, formerly- and never-depressed students, using an essay-writing task. Essays will be broken down into utterances, and each utterance will be coded as either a contextual or general thought or memory, which is either positive or negative in valence. Analysis of the number of utterance types between the three groups will shed light on the inconsistencies in the literature.

The second area highlighted as needing further investigation, is the application of DRT (Brewin, 1989) to depression. More specifically, whether reducing access to negative SAMs, by encouraging participants to put their current mood in to context, can lead to a reduction in depressed mood. DRT provides an alternative, multi-level approach to cognition and emotion, which can address some of the limitations of Beck's (1967) and Abramson et al's (1989) traditional cognitive theories. Although Beck's cognitive theory and Abramson et al.'s hopelessness theory have lead to huge advances in the understanding and treatment of depression, research can be furthered through a more detailed understanding of how cognitions lead to emotion. The main limitation of traditional theories is their inability to account for the difference between rational and

emotional thinking in relation to mood. These theories therefore cannot explain how some patients are able to rationalise their negative thoughts yet remain depressed. By suggesting that different types of information are represented by different processing levels, DRT is able to distinguish between rational and emotional thinking. Therefore, the second objective of this thesis is to investigate the VAMs vs. SAMs mechanism proposed in DRT, by replicating the research by Watkins et al. (2003). Limitations and areas for development of their study will be addressed, with the aim of investigating the use of cognitive tasks to manipulate despondent mood.

Related to the second objective is the third objective. The successful manipulation of despondent mood has important clinical implications. The effects of cognitive interpretive bias training on anxiety have been of recent interest. Studies by Mathews and Mackintosh (2000), MacLeod et al. (2002), Yiend et al. (2005), and Wilson et al. (2006), have all successfully produced training-congruent changes in anxious mood in non-clinical samples through active generation of the meaning of ambiguous material. By inducing either a negative or positive interpretive bias, increases and decreases in mood (respectively) were seen. Although MacLeod et al. and Wilson et al. also looked at depressed mood, only MacLeod et al. have been successful in inducing changes in despondent mood. Furthermore, MacLeod et al. analysed combined anxious and depressed mood scores together, rather than looking at the independent changes in depressed mood. As such, further investigation of the use of interpretive training tasks on depressed mood is needed.

Rather than looking at the effects of negative and positive interpretive training on depression, research in this thesis will attempt to train a contextual interpretive bias. As discussed, AMT studies find OGM to be a robust characteristic of depression. Both traditional and multi-level theories cite the influence of overgeneralisations, which are based on memories of past experiences, on depression. For example, Beck (1967) suggests that the negative schema contain generalised beliefs about the self, which are based on past experiences. In depression, negative schemas are used to interpret subsequent events, leading to generalised negative interpretations of the self, world and future. Similarly, Abramson et al. (1989) suggest that depression is most likely to develop when negative events are interpreted as global and stable, interpreting outcomes as resulting from unchanging and pervasive aspects of the self. Brewin (1989) suggests a direct link between overgeneral representations and depression. The activation of negative SAMs, representing summaries of related past experiences, is suggested to lead to negative interpretations of subsequent situations and physiological changes such as depressed mood. Therefore the detrimental effects of overgeneralising the outcomes and interpretations of past experiences, rather than seeing each event and its outcomes as distinct is prevalent in the depression literature. Therefore, the third objective of this thesis is to develop a new training task that forces participants to generate a contextual interpretation of negative events rather than a general one. Using a depressed sample, the effects of contextual interpretive training on despondency will be investigated.

To summarise, the characteristics and modification of overgeneral memory in depression will be investigated. The next chapter will explore inconsistencies in the

AMT literature and between AMT results and cognitive theories of depression. The naturally occurring thoughts and memories of currently-, formerly- and never-depressed students, will be analysed to gain insight in to generalised representations in memory. Chapters three, four and five will investigate whether prompting contextual processing of negative cognitive primes can limit the activation of dysphoric mood. Successful reduction of dysphoria will provide support for the detrimental effects of negative general SAMs and the beneficial effects of contextual VAMs on mood. These experiments will be based on a scrambled-sentences paradigm developed by Watkins et al. (2003). The final objective, to develop a training task that encourages depressed participants to interpret negative events as contextual will be investigated in chapters six and seven. The design of the task will be influenced by previous investigations that have successfully impacted anxiety levels by training individuals to adapt their attentional or interpretive biases (e.g., Grey & Mathews, 2000; MacLeod et al., 2002; Mathews & Mackintosh, 2000; Wilson et al., 2006). The findings, implications, future directions and conclusions of the data collected throughout the thesis will be discussed in Chapter eight.

## CHAPTER 2

### GENERALITY IN THE THOUGHTS AND MEMORIES OF THE CURRENTLY-DYSPHORIC, FORMERLY-DEPRESSED, AND NEVER- DEPRESSED

Depression has been consistently associated with the recall of overgeneral memories on the Autobiographical Memory Test (AMT: Williams & Broadbent, 1986) and with overgeneral patterns of thinking (e.g., Beck, 1967; Abramson, Seligman, & Teasdale, 1978). However, whereas AMT results have found overgeneralized memories recalled to *both* positive and negative cue words, Beck's (1961) cognitive model of depression has emphasized that depression is associated with *negative* generalized cognitive schema in memory, which are based on past experiences and used to interpret subsequent experiences. The present study investigates contrasting predictions made by these two approaches concerning the relative proportions of positive and negative general thoughts and memories produced during a standardized writing task by never-, formerly-, and currently-depressed students.

Overgeneral memory (OGM) refers to memory for people, places, or activities that is not contextualized, in that it refers to a time period that is non-specific or lasts longer than one day ("extended" memories), or refers to events that happened repeatedly ("categoric" memories: Williams & Scott, 1988). The study of OGM is almost invariably investigated using the AMT, where participants respond with a specific personal memory to positive and negative cue words. Some studies have found the

depressed produce fewer specific responses to positive cues (e.g. McNally et al., 1994), some have found reduced specificity to negative cues (e.g. Jones et al., 1999), and others have found reduced specificity to positive and negative cues (e.g. Goddard et al., 1996). A meta-analysis of the AMT (van Vreeswijk & de Wilde, 2004) considered data from 14 studies, and concluded that the depressed produce fewer specific memories and more OGMs to *both* positive and negative cues, with differences in memory specificity to positive and negative words being positively correlated. OGM is also considered to be a trait marker of depression, present in the formerly as well as the currently depressed (Williams, Barnhofer, Crane, Hermans, Raes, Watkins, et al., 2007).

These well-established findings can be interpreted in two main ways: First, the depressed may adopt an overgeneral retrieval style to avoid specific painful memories (Williams et al., 2007). Consistent with Conway and Pleydell-Pearce's (2000) explanation of OGM, recall of general memories compared to painful specific memories may result in less negative affect. As such, the depressed may have more, or more accessible, overgeneral representations of multiple positive and negative events. The second interpretation is that overgeneral retrieval is the result of features of the AMT. For example, the AMT may encourage an analytical thinking style, which involves "thinking about the self, about depression-related thoughts and feelings, and about how to understand what is going on" (Teasdale, 1999). Consistent with this, an analytical thinking style has been found to be related to an increase in the recall of categoric memories on the AMT (Crane, Barnhofer & Williams, submitted; Watkins & Teasdale, 2001). Alternatively, the depressed may produce more OGMs because they



are distracted by intrusive cognitions (Kuyken & Brewin, 1995); or have reduced cognitive capacity, making AMT instructions difficult to follow (Dalglish et al., 2007). Thus, an excess of responses defined as overgeneral by the AMT does not necessarily imply the existence of generalized memory representations, a point that has also been made by Rottenberg, Hildner and Gotlib (2006). These two types of explanation can be evaluated by determining if there is independent evidence for an excess of generalized positive and negative representations in a depressed sample using an alternative memory paradigm.

Overgeneral thinking is also a prominent aspect of cognitive theories of depression. Beck (1967) first noted that patients' thinking was characterised by a number of errors including abstraction, overgeneralization and exaggeration. Overgeneralization is typically found in relation to global negative characteristics of the self such as being worthless, incompetent, or unlovable. These predictions have been confirmed by studies showing that overgeneralization is one of the strongest markers of depressive thinking (Carver & Ganellen, 1983). Beck (1967, 1991) proposed that semantic knowledge about the self from numerous different episodes of disappointment, maltreatment, or adversity is abstracted to form schemata. These generalized representations in memory support overgeneralized thinking. Other theories similarly tie depression to generalized representations in memory containing negative (but not positive) information about the self (Brewin, 1989; Watkins, Teasdale, & Williams, 2003).

Abramson, Metalsky and Alloy (1989) proposed that hopelessness, a critical antecedent of depression, develops when negative (but not positive) events are interpreted as being caused by unchanging and pervasive aspects of the self. Vulnerability to depression is associated with a general tendency to attribute negative events to stable and global factors, and with a general tendency to infer negative consequences and characteristics about the self, given the occurrence of negative life events. Consistent with this, depression is associated with the making of stable and global (i.e., attributions that are generalized across time and situations) for negative outcomes, but unstable and specific attributions (i.e. attributions that are contextualized in time and situation) for positive outcomes (Sweeney, Anderson, & Bailey, 1986). Inherent in hopelessness theory is an incompatibility between positive overgeneralisations and depression. If individuals interpreted positive events as being a result of unchanging and pervasive causes, they would expect many such positive events in the future and thus be unlikely to become hopeless and depressed. Therefore, in contrast to the AMT literature, both cognitive and hopelessness theories imply that depression should be exclusively related to *negative* overgeneralization.

Conversely, it could be argued that, consistent with cognitive and hopelessness theories, rather than responding positively to positive cues, participants give a negative response to positive cues. For example, to the cue word 'happy' participants could say 'I never feel happy'. However, after an extensive exploration of the literature and examination of examples of responses to positive and negative cue words, this does not seem to be the case (i.e. participants respond positively to positive cue words). Therefore, the contrast being investigated between predictions of the AMT literature

and cognitive/ hopelessness theories is based on the assumption that memories retrieved in response to positive cue words are also positive.

The current study investigated the thoughts and memories of currently-dysphoric, formerly-depressed and never-depressed college students, spontaneously produced during a standardized writing task. The data was collected from essay transcripts gained from a study by Rude, Gortner, and Pennebaker (2004), who were studying the language use of depressed and depression-vulnerable college students. Participants were asked to write about their thoughts and feelings about starting college, thereby generating a more naturalistic sample of thoughts and memories. Rude et al. found currently-dysphoric participants used more negatively valenced words and used the word “I” more than never-depressed participants. Formerly- and never-depressed participants did not differ on these indices of depressive processing. An independent coding scheme was developed for the current study to classify each utterance in these essays as a thought or a memory, as general or contextual (including, but not limited to, the criteria for a specific memory on the AMT), and as positive or negative.

Drawing on previous findings reviewed above, contrasting predictions for this dataset were derived (for a similar approach involving contrasting predictions from this literature see Rottenberg, Hildner, & Gotlib, 2006). Cognitive and hopelessness theories of depression suggest that depression is maintained primarily through negative general thinking, which by implication, is based on negative general memory representations. In the absence of a mood challenge, negative thinking and recall return to normal as depression remits. Therefore, we expected that the currently-dysphoric

students would produce fewer positive and more negative general thoughts and memories than formerly- and never-depressed students. From the AMT literature, which has found categoric memory recall to negative and positive cues by currently- and previously-depressed patients, we predict that currently-dysphoric and formerly-depressed students would produce more positive and negative general memories, and fewer positive and negative contextual memories, than never-depressed students.

## **2.2 METHOD**

### ***2.21 Participants***

Rude et al.'s (2004) sample comprised students from introductory psychology classes at the University of Texas, Austin. Participants were split into groups according to their scores on the Beck Depression Inventory (BDI: Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), a self-report measure of current depression symptoms, and the Inventory to Diagnose Depression-Lifetime (IDD-L: Zimmerman & Coryell, 1987), a measure of past depression symptoms. Participants were allocated to the currently-dysphoric group if they scored more than 14 on the BDI, as suggested by Beck (1967; mean BDI = 20.05). Participants scoring zero or one on the BDI were excluded as Clark et al. (1998) had demonstrated that such people may "fake good tendencies". Formerly- and never-groups were defined via IDD-L scores, with participants scoring above 25 being classified as formerly depressed (mean IDD-L = 40.59), and those scoring below nine as never depressed (mean IDD-L = 1.18). A total of 123 students took part, aged from 17 to 50 years old. Thirty-one students (29 women) comprised the currently-depressed group (mean age = 18.14 years), 26 (20 women) the formerly-depressed group (mean age = 19.08 years), and 66 (46 women) the never-depressed group (mean age = 18.95 years).

### ***2.22 Design***

Rude et al. employed an independent samples design, with participants allocated to either the currently-dysphoric, formerly-depressed, or never-depressed group based on their BDI and IDD-L scores. The independent variable for the current study is the

group participants were allocated to. The dependent variable is the number of each type of utterance produced by participants in their essays.

### ***2.23 Procedure***

Participants first completed a questionnaire pack including the IDD-L. The second data collection session took place between four and six weeks later and asked participants to complete the BDI before writing an essay. The instructions given by Rude et al. to participants were as follows:

“Starting college involves many significant changes, including moving to a new place, being separated from important people, taking on new challenges, and meeting new people. In the 20-minute writing task that follows, please describe your deepest thoughts and feelings about being in college. Once the experimenter asks you to begin writing, we would like you to write continuously off the top of your head. Don’t worry about grammar or spelling. Just write continuously.”

### ***2.24 Essay Coding***

Essays were broken-down into utterances and each utterance was compared to the coding criteria. Utterances that met the criteria were coded for positive and negative valence, and as contextual or general. These utterances were then further coded as thoughts or memories. An utterance consisted of a subject-verb clause, unless that clause did not make sense on its own, in which case the whole sentence was included in the code. Eighty-four percent of utterances produced could be coded using all three

of the categories, a short description of which follows (see Appendix A for examples). The remainder of the utterances did not meet the coding criteria, but were included in the calculation of the total number of utterances produced by each participant.

**Valence.** Whether something is coded as positive or negative is dependent upon those feelings being explicitly stated by the person, and should not merely be implied by the prose. A positive utterance refers to something that makes the person feel good/results in a good outcome. A negative utterance refers to something that makes the person feel bad/results in a bad outcome.

**Theme.** General utterances were distinguished from contextual utterances. As the essays were broken-down in to utterances, each of which was coded, broader definitions than those employed by the AMT were needed. The definitions employed included, but were not limited to, the AMT definitions:

1. *Contextual utterances.* These had to contain at least two of:
  - A specific place
  - A specific object
  - A specific time (lasting a maximum of 24 hours). This can include reference to a specific day in the future (e.g. “next Tuesday”, “Christmas Day”), but not “next week”; and the present time period, e.g. “I have psychology next” refers to immediately after the experiment.
  - A specific person or named people. This can include “I” (unless I refers to “all” situations/”many” things, etc); also included “parents/brothers/sisters”, as this refers to a small number of specific people (not aunts/uncles, etc – could

be any aunt/uncle ...). Groups of people (e.g. “friends”, “family”), where the members of the group were not specified, were **not** included.

2. *General utterances.* These could contain one reference to a specific place, object, person, or time, but had *also* to refer to at least one of:

- A time period longer than one day
- Many people
- A group of places (e.g., colleges), objects (e.g., cars) or events (e.g., classes)
- A generalized description of something or someone with no reference to time, place, object, or person.

Utterances containing qualifiers such as “*some*”, which do not imply one specific event or all similar events, were not coded as either contextual or general.

**Type: Memory vs. Thought.** Memories were based, directly or indirectly, on events the person had experienced and could in principle remember, whereas thoughts referred to statements rather than experiences. Thoughts could include the statement of facts such as how old a person was or what course they were studying.

1. *Memories.* These included:

- Things the person enjoys doing/experiencing, e.g. “I really like going to Sixth Street”.
- Utterances had to be personally relevant to the participants, references to



other people's experiences were not included.

- Reminiscing about the past, e.g. what they used to do at school.
- Self development – e.g. remembering how they used to be and how they are now, e.g. “I am more responsible here than I used to be”, *not* “I am/feel I am a responsible person”.
- Statements relating to whether person likes/dislikes something, as long as it refers to something they have done/experienced, e.g. “I love *being at* college”, *not*, “I love college”.
- Memories of specific things they have been told (if relevant to self), “e.g. “I remember when my parents told me that ...”

2. **Thoughts.** These included:

- Personal thoughts that cannot be proved/are assumed/are not fact. E.g. “I am going to fail this semester”, “I am the only person here who has not settled in, everybody else has”.
- Personality traits if purely descriptive, e.g. “I am mature”.
- Phrases included were:
  - “I think/guess ...”
  - “I feel that ...”, *unless* talking about a particular experience/time
  - “Leaving an impression on me”
  - Feelings towards something, e.g. “I love/hate/like...”, as long as not talking about something they have *done*.
  - “I miss ...”
  - “I am worried about .../ ... worries me”

### ***Coding Frame Reliability and Validity***

To assess the reliability of the coding frame, 30% of the transcripts were coded by two researchers, both of whom were blind to the experimental group the transcripts belonged to. Each combination of coding categories was given a number between 1 and 8 (e.g., an utterance coded as a *negative general thought* was given a '1'; a *negative general memory* was given a '2'; etc.). The number given to each utterance, representing the code it was given, was compared between the two researchers. A percentage agreement of 81.8% was achieved. Kappa was .80, indicating excellent agreement (Fleiss, 1981).

To assess the validity of the coding frame, positive and negative categories were collapsed across theme and memory/thought, and compared to the positive and negative categories identified by Rude et al. (2004). Rude et al. analysed the texts using the computer-based text analysis program Linguistic Inquiry and Word Count (LIWC: Pennebaker et al., 2001). The LIWC has a dictionary of 2290 words and word stems which it uses to compare the students' texts on a word-by-word basis. Words are organised into over 70 language categories, the ones relevant to this study and comparable to the coding frame being positive emotions and negative emotions. Table 2.1 presents the correlations between the mean percentage of utterances coded as positive or negative in each group and the number of words identified by the LIWC as positive or negative emotions. Given the very different principles used by this study and the LIWC to extract and code the data, the correlations suggest good agreement in the coding of valence.

**Table 2.1:** Correlations between study and LIWC positive and negative categories among the never-depressed, formerly-depressed, and currently-dysphoric

Group	Coding frame category	LIWC category	
		Positive emotion	Negative emotion
Currently-dysphoric	Total positive	.48**	-.32
Formerly-depressed		.56**	-.19
Never-depressed		.58**	-.09
Currently-dysphoric	Total negative	-.44*	.58**
Formerly-depressed		.19	.48*
Never-depressed		-.20	.40**

\*  $p < .05$ ; \*\*  $p < .01$

## 2.3 RESULTS

### 2.31 Descriptive Statistics

Group comparisons were carried out by Rude et al. (2004) on the data to make sure that the groups were comparable. Using one-way ANOVAs, they found no significant differences between the groups in age ( $F(2, 121) = .85, p = .43$ ). A priori comparisons of BDI and IDD-L scores between the groups confirmed that the currently-dysphoric group scored significantly higher on the BDI than the formerly- and never-depressed groups ( $t_{(121)} = 4.88, p < .001$ ). Formerly- and never-depressed groups did not differ on BDI score, but did differ on IDD-L score ( $t_{(121)} = 16.36, p < .0001$ ) (Rude et al., 2004).

### 2.32 Utterance data analysis

Positive and negative utterances with a contextual or general theme were distinguished, and separated into thoughts and memories. Utterances that did not meet the coding criteria were not coded, but were included in the total utterance count. This meant that the category assigned to one utterance did not affect that assigned to another utterance, as not all utterances could be coded. The total number of utterances produced by each individual was calculated and category scores were converted into a percentage of total utterances in order to control for differences in narrative length. Normality tests were carried out on the data, revealing both skewness and kurtosis, which could not be corrected through data transformations. Kruskal-Wallis analyses were therefore carried out between the groups for each utterance type. Significant Kruskal-Wallis tests were followed by Mann-Whitney tests between the groups to see

which group(s) were producing more/less of a particular utterance type compared to the other groups. The results of these analyses are summarised in Table 2.2.

**Table 2.2:** Mean percentages of contextual and general memories and thoughts by group: currently-dysphoric, formerly-depressed, and never-depressed

Utterance type	Valence	Currently	Group Formerly	Never	$\chi^2$ (df = 2)
Contextual memory	Positive	0.67 (1.46)	0.40 (1.03)	1.27 (2.64)	2.34
	Negative	1.76 (2.74)	1.02 (1.95)	0.94 (2.18)	4.92
Contextual thought	Positive	1.26 (1.99)	1.74 (2.07)	1.89 (2.66)	1.09
	Negative	3.20 (3.41) <b>a</b>	1.11 (1.73) <b>b</b>	1.06 (1.89) <b>b</b>	14.21**
General memory	Positive	4.10 (4.92) <b>a</b>	6.99 (6.14) <b>b</b>	8.19 (7.74) <b>b</b>	10.58**
	Negative	7.56 (4.52) <b>a</b>	5.41 (4.43) <b>ab</b>	5.03 (4.49) <b>b</b>	6.60*
General Thought	Positive	4.78 (3.71) <b>a</b>	9.58 (7.52) <b>b</b>	8.60 (7.44) <b>b</b>	10.06**
	Negative	20.12 (9.67) <b>a</b>	9.56 (5.16) <b>b</b>	8.86 (7.70) <b>b</b>	31.77**

\* $p < .05$ ; \*\* $p < .01$ .

N.B. Means with different subscripts differ at  $p < .05$

The currently-dysphoric group produced significantly fewer positive general memories and thoughts, and significantly more negative general thoughts, than the never- and formerly-depressed groups. The currently-dysphoric group also produced more negative general memories than the never-depressed group, but not the formerly-depressed group. The formerly- and never-depressed groups did not differ in the number of negative or positive general utterances (neither thoughts nor memories) produced. Inspection of the contextual categories shows that the currently-dysphoric group produced more negative contextual thoughts, than the never- and formerly-

depressed groups. No other significant differences in the numbers of positive or negative contextual thoughts or memories between the groups were found.

## **2.4 DISCUSSION**

The data indicated that the currently-dysphoric group produced significantly fewer positive general memories and thoughts, and significantly more negative general thoughts, than the never- and formerly-depressed groups. The currently-dysphoric group also produced more negative general memories than the never-depressed group, but not the formerly-depressed group. The formerly- and never-depressed groups did not differ in the number of negative or positive general thoughts or memories produced. Inspection of the contextual categories shows that the currently-dysphoric group produced more negative contextual thoughts, than the never- and formerly-depressed groups. No other significant differences in the numbers of positive or negative contextual thoughts or memories between the groups were found.

These findings, apart from the non-significant difference between currently-dysphoric and formerly-depressed group in negative general memories produced, support the hypothesis that the currently-dysphoric students would produce fewer positive and more negative general thoughts and memories than formerly- and never-depressed students. The hypothesis that currently-dysphoric and formerly-depressed students would produce more positive and negative general memories, and fewer positive and negative contextual memories, than never-depressed students was not supported.

Other studies using naturalistic data are consistent with this conclusion. Riskind, Castellon, and Beck (1989) used the Content Analysis of Verbatim Explanations (CAVE: Peterson et al., 1992) technique to analyze diary entries from the Daily Dysfunctional Thought Records of 24 patients with either major depressive disorder or generalized anxiety disorder. Explanations of causality of events were rated for internality, stability and globality using 7-point scales. CAVE scores revealed that the depressed group had a greater tendency to attribute negative events to internal, stable, and global causes than the anxious group. The scores from the two clinical groups were also compared to those from a study by Peterson, Bettes, and Seligman (1985). Explanations of causality from descriptions produced by students about the two worst events they had experienced in the preceding year were analysed using the CAVE technique. It was found that attributions by the depressed group, but not the anxious group, were significantly more stable and global than those of the student group used in Peterson et al.'s study.

Also of interest in the current study were the proportions of positive and negative memories that were coded as contextual or general. The task elicited a general preponderance of general over contextual memories in all the groups, and floor effects may constrain the accuracy of estimates for the contextual memories. Positive memories were at least six times more likely to be general than contextual, and negative memories were at least four times more likely to be general than contextual. Although there is more generalized thinking and remembering in depression, the data suggest that this needs to be interpreted within the context of a pervasive negativity bias that affects many types of cognition.

The contradictory finding of positive overgeneral memory recall on the AMT to the theoretical stance of cognitive theories that overgeneralisations in the depressed are negative and unlikely to be positive, is drawn attention to in this study. The data raise some concerns about the ability of the AMT to measure the content of depressive thinking when uninhibited by task constraints. Kuyken and Brewin (1995) suggested that the OGM problems seen in the depressed may be secondary to reductions in working memory brought about by attempts to avoid intrusive autobiographical memories. This explanation implies that overgenerality on the AMT is a by-product of difficulty in following the task requirements rather than an essential characteristic of depression. Consistent with this, a series of studies by Dalgleish, Perkins, Williams, Golden, Barrett et al. (2007) demonstrated that, independent of levels of depressed mood, the AMT is dependent on working memory capacity (WMC). Importantly, Dalgleish et al. were able to show that the depressed can be made to produce more specific memories than the nondepressed by reversing the task instructions. This is powerful evidence that overgenerality on the AMT is at least in part accounted for by reductions in working memory that affect task performance in a non-specific fashion.

Dalgleish et al. suggest several possible mechanisms through which the AMT may be affected by reductions in working memory, in particular executive control: patients may find it difficult to inhibit distracters triggered by the task; patients may be unable to retain the entire set of task goals set by the AMT; patients may have a tendency to employ automatic rather than controlled processes on cognitively demanding tasks due to past unsuccessful attempts at controlled processing. It is argued that the essay task



used in the present study is not limited by such executive control problems. For example, the task instructions remain in front of the participants, hence they do not have to retain them in memory. In addition, participants are instructed to “write continuously”, inviting them to record all related thoughts, not just one particular memory.

The AMT has also been criticised for imposing time constraints on participants’ replies and for forcing participants to respond to cue words that may not be relevant to a depressed person’s personal concerns (Rottenberg et al., 2006). Rottenberg et al. tested for memory detail, ease of retrieval, and memory emotionality in currently-, formerly- and never-depressed participants using an interview that asked participants to recall their happiest and saddest lifetime events. The interview was considered more ecologically valid than the AMT as there were no time constraints; it gave participants several opportunities to elaborate on their memories; and it focused on events meaningful to the person. Although few overgeneral memories were elicited by this method, Rottenberg et al. investigated the amount of detail, ease of memory retrieval, and emotionality of the memories that were retrieved. No group differences were found in the saddest memories, but the currently-depressed group’s happiest memories were less detailed, harder to retrieve, and less emotional. Like the present study, they suggested that, inconsistent with AMT predictions, the data reflected a tendency for depressed individuals to more readily recall sad than happy memories.

An alternative interpretation of both Rottenberg et al.’s findings and the findings of the present study concerns the possible impact of mood-congruency. It is suggested that

the material people encode is affected by their current mood state: when in a bad mood, people are more like to encode negative details, and when in a good mood, people are more like to encode positive details (Rusting, 1998). Similarly, research suggests that recalled information is affected by one's current mood state, with individuals like to recall thoughts and memories with an affect which is congruent with their current mood (see Dalgleish & Watts, 1990 for a review). Consistent with this, the present findings and those of Rottenberg et al. both suggest that currently-depressed participants, whom were likely in a negative mood whilst carrying out the experiment, recalled a greater number of negative than positive memories compared to formerly- and never-depressed participants. However, although this presents an alternative account for the results, it should also be noted that the currently-dysphoric group in the present study did not recall significantly more negative thoughts or memories for all of the coding categories, suggesting that mood-congruency cannot solely account for the findings. The currently-dysphoric group did not produce significantly more negative contextual memories than either the formerly- or never-depressed groups, and did not produce more negative general memories than the formerly-depressed group. Similarly, mood-congruency would suggest that the currently-dysphoric group should consistently produce fewer positive utterances than the formerly- and never-depressed groups. However this was not the case for the categories of positive contextual memory or positive contextual thought. To further investigate the possible impact of mood-congruency, future studies could ask participants to rate their mood before and after the essay task so that mood scores can be correlated with the number of each utterance type to see whether extent of negative mood significantly correlates with number of negative/positive utterances produced.

Our data support the interpretation that overgeneral responses on the AMT may reflect problems in task compliance rather than necessarily revealing anything about the nature of underlying memory representations. However, among the limitations of the study was the small number of contextual memories elicited. Future studies should select a topic encouraging equal amounts of contextual and general thinking. Also, naturalistic data are inherently more ambiguous than experimental data and thus required somewhat broader coding definitions than the AMT in order not to exclude most of the material. For example, “I like going to Sixth Street” would be coded as a (general) memory rather than a thought as it is assumed that the person must be drawing at least partially on memories in order to make such a statement. Similarly, it was necessary to alter definitions of specificity and overgenerality used in the AMT in order to reflect the nature of the material while remaining as true as possible to the original conceptual distinction. A final limitation was that currently-dysphoric participants were experiencing low symptom levels relative to clinical samples. Rude et al. (2004) reported that many participants in this group were experiencing a first depression (perhaps due to their relative youth). Future studies should use participants experiencing more severe depression. Future research should replicate these findings using a more severely depressed sample. Replication of the results would be strengthened through inclusion of the AMT to compare number of negative and positive, contextual and general memories produced by the same participants on each task. It is also suggested that future research asks participants to write about a topic that will generate a more balanced number of contextual and general utterances. The low number of contextual utterances may indicate floor effects. However, as the primary aim of this study was to investigate the contrast between AMT literature and

cognitive theories in relation to overgeneral memories, the issues raised concerning the AMT still hold.

In sum, this study adds to recent data (Daggleish et al., 2005) that suggest overgeneral thinking in response to positive cue words may be an artefact of the AMT or of a particular style of thinking induced by experimental tasks rather than a stable characteristic of depression. Further research and analysis of currently-, never- and formerly-depressed participants' thoughts and memories is needed to support and extend these findings, and elaborate on the apparent inconsistencies between AMT data and cognitive theory. The data also underscored the more general importance of establishing that measures of cognitive functioning in groups suffering from psychological disorders are ecologically valid and are not secondary to cognitive limitations such as a reduction in working memory capacity.

The chapters that follow in this thesis continue to investigate overgenerality in depression. Rather than further investigating the characteristics of overgenerality in depression, the following chapters look at the mechanism that leads to overgeneralisations and their subsequent effects on mood. In addition, ways of incorporating contextual information in to memory representations will be tested to see whether activation of generalised representations, and therefore despondent mood, can be reduced.

## **CHAPTER 3**

### **EFFECTS OF CONTEXTUAL QUESTIONS ON EXPERIMENTALLY INDUCED DESPONDENCY: PART I**

Dual representation theory (DRT; Brewin, 1989, 1996) cites that generalised negative self-representations (e.g., “I am the sort of person that everyone laughs at”) that are activated in preference to contextualised negative memories (e.g., “I had too much to drink and made a fool of myself on Wednesday night”) have a causal role in persistent disorders such as depression. The relevance of this theory to depression has been directly tested by Watkins, Teasdale, and Williams (2003), who investigated whether increasing contextual information about negative cognitive primes would limit the effectiveness of those primes in producing dysphoric mood. Watkins et al. were one of the first to investigate this theory in relation to depression, but this mechanism has received little investigation since. As a result, the aim of the present study was to replicate and extend their finding by introducing a second set of contextual questions, and investigate a possible mechanism for the effect.

Support for negative thinking as both a cause (e.g. Teasdale & Bancroft, 1977) and effect (e.g. Teasdale, 1983) of depression, implies that a reciprocal relationship exists between depression and negative cognitions. Teasdale (1983) suggested that increased accessibility of negative cognitions and decreased accessibility of positive cognitions, would not only result in the depressed person recalling more negative memories, but also in a bias towards negative interpretations of events and self concepts. Similarly,

Beck's cognitive theory of depression (1967) relates depressed mood to automatic negative thoughts patients have concerning the self, the world and the future. These three areas of cognition are known as the "cognitive triad". Beck (1983) proposed that depressive disorders depend on the existence of negative generalised self-representations in memory, or "depressive schemas", concerning the cognitive triad. Consistent with this, overgeneralisation is one of the most characteristic forms of depressive thought (Carver & Ganellen, 1983).

Brewin (1989, 1996) elaborated on this, suggesting that similarities between recurring experiences are automatically stored, forming generalised representations that lack the contextual details of individual experiences and result in a form of abstract knowledge. These representations are labelled "situationally accessible memories" (SAMs), as they can be reflexively triggered by a related situation. SAMs are not a product of conscious reflection and thus their content is not directly knowable. However, automatic activation of SAMs makes individuals aware of their products in the form of mood changes, impulses, images, or automatic thoughts. These representations are distinguished from "verbally accessible memories" (VAMs), which are the consciously accessible record of autobiographical experience in which events retain their individuality and distinguishing contextual information.

Retrieval competition between relevant SAMs and VAMs can be triggered by negative events and mood states. The outcome of this competition can determine the present mood state. Retrieval of SAMs, in which negative experiences are generalised across time and across situations, is likely to maintain negative mood. Successful retrieval of

VAMs, in which negative experiences are linked to unique aspects of the situation, are unlikely to maintain negative mood (Brewin, 2006) as a more rational interpretation of the event is made, enabling the individual to put their mood in to context. This implies that helping patients to consider the context of events should reduce retrieval competition of SAMs. Since detailed information about time, place, emotional response, etc is encoded in VAMs but not SAMs, a contextual focus should make the former relatively easier to retrieve. Therefore, the tendency for a situation to prime the retrieval of a negative SAM can potentially be reduced by increasing contextual information (the meaning, sensory and response elements) about a situation (Brewin, 1989).

Watkins, Teasdale and Williams (2003) tested this by investigating whether directing healthy individuals to process negative primes in a more contextual way would reduce negative mood. Watkins et al. developed a scrambled sentences task consisting of negative self-referent Velten primes (Velten, 1968), which acted to prime negative mood and constructs (therefore acting like SAMs), and either contextual or control questions. After undergoing a voluntary despondent mood induction procedure, participants unscrambled the scrambled versions of the sentences. The contextual questions were constructed to be relevant to the negative Velten primes. The aim of these questions was to make participants aware of the wider context of their current mood, encouraging participants to realise that their mood will not last forever and that moods do change and vary. For example, Watkins et al. proposed that primes such as “I feel sad” would be less likely to activate negative SAMs if put into the broader context of moods changing over time via contextual questions such as “How long does

any mood last?”. Therefore, the contextual questions were designed to activate contextual VAMs rather than general SAMs. The control questions were matched for length and structure with the contextual questions, but did not refer to mood.

Consistent with prediction, Watkins et al. (2003) found that participants unscrambling the contextual questions reported significantly lower dysphoric mood than the control group. This implies that the meaning of a prime can be influenced by awareness of its context. These results contrasted with those of an earlier study (Watkins, Teasdale, & Williams, 2000) in which unscrambling the same set of sentences did not lead to improved mood in participants with naturally occurring depressive mood. However, there were a number of differences between the two studies, including the presence of prior interventions prompting rumination or distraction in the 2000 study. The first aim of the current study was to replicate Watkins et al.’s (2003) finding that unscrambling contextual questions will produce a reduction in induced dysphoric mood in healthy volunteers.

Abramson, Seligman and Teasdale’s learned helplessness theory of depression (1978) suggests that depression develops when negative events are interpreted as being caused by unchanging and pervasive aspects of the self. This model suggests that the feeling of helplessness, which leads to depression, develops when people interpret feelings and events as stable (indicating that they will last forever) or as global (indicating that the current event will affect all subsequent events). Conversely, helplessness is unlikely to develop if people interpret feelings and events as unstable and/or specific,



thus realising that feelings do not last forever, and do change from one event to another.

This implies there could be more than one type of contextual thinking: one related to stable feelings over *time*, and one related to global feelings across *events*. The contextual questions developed by Watkins et al. (2003) encourage an unstable form of contextual thinking, encouraging participants to consider their mood during different times in their life. Therefore, the second aim of the present study was to extend the previous research in this area by investigating whether encouraging a specific form of contextual thinking, which considers mood in relation to different events, would also reduced despondency.

An additional methodological issue that has been considered in the present study concerns the Velten primes. Watkins et al. (2003) added an extra word to the primes before scrambling them to give the impression that they were interested in the way in which participants unscrambled the primes. Inspection of these sentences indicated that the word chosen could affect the meaning of the prime, leading to a lesser or more extreme version of the prime. For example, "I can't often bothered sometimes be" can be unscrambled as "I *often* can't be bothered" or "I *sometimes* can't be bothered". It is possible that participants in the contextual group consistently unscrambled the primes to give less extreme solutions, which in turn may have reduced dysphoric mood. The possibility that the contextual group was not effectively exposed to the same intensity primes provides an alternative explanation of the results and possible confound to the findings that does not involve contextual thinking or the retrieval of more

contextualised representations. Consequently, the third aim of the present study was to examine whether the version of the prime unscrambled affects despondency.

Finally, Watkins et al. (2003) noted that there was no direct test of changes in the activation of cognitive representations of the primes, providing limited support for the mechanism proposed in Brewin's DRT. The final aim of the present study was to inspect any changes in the representation of thoughts and memories between the groups, using a writing task.

In summary, the present study had four aims:

1. To replicate and support Watkins et al.'s (2003) findings.
2. To investigate the effects of specific-contextual questions on despondency.
3. To investigate the possible confounding effects on despondency of the version of the Velten primes unscrambled.
4. To demonstrate a change in cognitive processing via the recall of more contextual thoughts.

To achieve these aims, Watkins et al.'s (2003) study was modified in two ways. Firstly, a set of specific-contextual questions was introduced, in addition to the unstable-contextual and control questions. Consistent with Watkins et al.'s scrambled sentences task, as well as the scrambled questions (whether unstable-contextual, specific-contextual, or control), participants in each group unscrambled Velten primes, which were included to prompt negative constructs. Secondly, a stream of

consciousness task was added to investigate whether the contextual groups (unstable and specific) produce more contextual thoughts than the control group.

Based on the literature and Watkins et al.'s (2003) findings, the hypotheses for the present study were:

- i. Despondent mood will be significantly lower in the unstable and specific groups than the control group after the scrambled-sentences task.
- ii. Despondency will be affected by the number of extreme versions of Velten primes unscrambled.
- iii. Participants in the unstable and specific groups will produce more contextual and less general thoughts during the stream of consciousness task than the control group.

## **3.2 METHOD**

### ***3.21 Participants***

Eighty-six volunteers were recruited through posters displayed in various University College London departments and halls of residences, or from the Psychology department's online subject database. Subjects between the ages of 18-30 years old, with no current evidence of major depression, as assessed by the Beck Depression Inventory (BDI-II; Beck et al., 1996a; Appendix J), were recruited. A cut-off score on the BDI of  $\leq 14$  on the day of the experiment was applied for ethical reasons, to prevent anyone with more than a mild level of depression (as defined by Beck et al., 1996a) from participating in the negative mood induction. Data from 32 participants were not included in the analysis, as these participants failed to report a mood change of at least 20 points on a 0-100 despondency analogue scale after the mood induction procedure. This left 54 participants in the study.

### ***3.22 Design***

An independent samples design was employed, with participants randomly allocated to one of three groups: either the "unstable" group, who unscrambled the original unstable-contextual questions developed by Watkins et al. (2003); or the "specific" group who unscrambled new specific-contextual questions; or the "control" group who unscrambled the original control questions, which have no reference to mood (all groups also unscrambled the Velten primes originally used by Watkins et al.). The type of question participants unscramble in the sentences task (unstable, specific or control) acted as the independent variable. Dependent variables were despondent mood values

participants gave themselves throughout the study; whether an extreme or neutral word was chosen to unscramble the Velten primes in the scrambled-sentences task; and the number of contextual and general thoughts recorded during the stream of consciousness task.

### **3.23 Materials**

1. *Self-report mood measures.* Participants rated how despondent, happy and anxious they felt on three visual analogue scales ranging from 0 *I do not feel at all X* to 100 *I feel extremely X* (Appendix O). Despondency scores acted as the dependent variable. Happy and anxious scales were included to give participants the impression that the experimenter was interested in their mood in general, rather than just how despondent they were feeling. Induced depressed mood has been found to be represented by these analogue scales at a similar level to that found in moderately depressed patients (Martin, 1990).
2. *The Beck Depression Inventory (BDI-II).* The BDI-II (Beck et al., 1996a) was completed by all participants as a measure of depression. This is a 21-item self-report questionnaire. Each item has four statements associated with it. Participants were asked to circle the number that best described how they had been feeling over the last 2 weeks. If two statements were equally applicable, participants circled the statement with the highest number. Responses were summed to give a total BDI score. Items include sadness, self-criticism and indecisiveness.
3. *Mood Induction Procedure (MIP).* The MIP was a combination of a musical mood induction, where participants were asked to listen to seven minutes of

Prokofiev's *Russia under the Mongolian Yoke* played at half speed and an autobiographical recall task (Watkins et al., 2003). Whilst listening to the music, participants wrote about a time in their lives when they had felt depressed and low, as if they were writing a letter to a close friend or a diary entry. This MIP was found to successfully induce a sad mood in Watkins et al.'s (2003) study.

4. *Scrambled-sentences task (SST)*: Participants were asked to unscramble 32 sentences (Appendix K), 23 of which were negative self-referent statements (Velten, 1968) scrambled with an extra word added: e.g. "life often seems boring" was scrambled to "often boring seems life uninteresting", and "I remember many sad times" was scrambled to "many sad I remember times various". The extra word was added to give participants the impression that the experimenters were interested in the version of the sentence unscrambled. It was explained that participants should use as many words as possible to make a meaningful sentence, but in several cases there would be a choice as to which version of the sentence they could unscramble. The Velten statements acted as the mood maintaining primes with the hypothesis that they would influence mood and memory by independently priming negative constructs (SAMs) (Riskind & Rholes, 1985).

The other nine sentences were prompts in the form of scrambled questions, which acted as the independent variable in each group: these were either control questions, unstable-contextual questions or specific-contextual questions (see Table 3.1). The choice of Velten primes, and the control and

unstable questions were taken from Watkins et al.'s (2003) study. Watkins et al. designed the unstable questions to increase participants' awareness of the broader context of their current mood with the aim of reducing the number of pre-existing memories related to the Velten primes. The control questions did not refer to mood but were matched with the unstable questions for structure and length. The specific questions designed for this study had a similar structure and length to the unstable questions, and also prompted a broader awareness of the temporal and personal context relevant to current mood. However, whereas the unstable questions related to context over time, the specific questions related to context over events.

5. *Stream of consciousness task*: Participants listened to *Russia under the Mongolian Yoke* for a second time whilst writing down what ever thoughts came to them, regardless of what they were.

### **3.24 Procedure**

Prior to beginning the study, participants read an information sheet (Appendix C) informing them about the MIP and key manipulations. An informed consent form (Appendix F) was signed, and participants were screened for depression using the BDI-II. The first set of mood scales was completed before the MIP, followed by a second set after the MIP. After this, the SST was completed, followed by a third set of mood scales, which were followed by the stream of consciousness task. The study ended with a final set of mood scales. Before participants left, they were given a debriefing sheet (Appendix G), asked whether they had any further questions, and whether they would like to engage in an happy MIP (listening to *Walking on Sunshine*

by Katrina and the Waves whilst writing about a time when they felt happy).

Participants were paid £6 for their time.

**Table 3.1:** Unstable, specific and control prompts

<b>Unstable questions</b> (Watkins et al., 2003)	<b>Specific questions</b>	<b>Control questions</b> (Watkins et al., 2003)
What different views do I have of myself?	What different views of myself do I have in different situations?	What different photos do I have of myself?
How long does this feeling last?	How much does a feeling transfer from one event to other events?	How long does this weather last?
What will I think about this in 10 years time?	Will this mood change over situations?	What will I buy with this ten pounds?
How long does any mood last?	What will I think about these feelings in different situations?	How long does any weather last?
How does this one moment fit into my whole life?	How much do my feelings change in new circumstances?	How does this one sofa fit into my whole house?
Have all my past feelings changed with time?	How have my past feelings changed with different circumstances?	Have all my skills improved with practise?
Don't I have both good and bad times?	Don't I experience both good and bad circumstances?	Don't businesses have both good and bad times?
How important will this moment appear from my deathbed?	How important is this relative to different situations?	How good will this view look from my window?
What fraction of me is how I feel at this moment in time?	What fraction of me is how I feel in this particular situation?	What fraction of my life do I spend asleep?



### 3.25 Coding

Thoughts recorded during the stream of consciousness task were coded as contextual or general, and as positive, negative or neutral in valence based on the coding criteria below. Coded examples of each type of thought can be found in Appendix B.

One thought was defined as a subject-verb clause unless the rest of the sentence was required for the phrase to make sense. A maximum of one sentence was included in one thought.

*“Contextual” thoughts:*

Must contain *at least 2* of the following:

- A specific place
- A specific object
- A specific person or named people
  - This can include “I” (unless I refers to “all” situations/“many” things, etc)
  - Also includes “parents/brothers/sisters”, as this refers to a small number of specific people (not aunts/uncles, etc – could be any aunt/uncle ...)
  - Groups of people (e.g. “friends”, “family”), where the members of the group were not specified, were **not** included.
- A specific time -
  - Time period is limited to a maximum of one day (24 hours). The person can talk about a specific day in the future, but not (e.g.) “next week”.

- This can also refer to the present time period – e.g. “I have psychology next” refers to immediately after the experiment.
- A specific time can also refer to an event that occurs on a particular day, e.g. Christmas Day/Valentine’s day.
- Can include something that we know occurs at a specific time, e.g. a TV program that is on one night a week.

*“General” thoughts:*

A general thought could contain **one** of a specific place/object/person/time, but must **also** contain at least one of:

- Reference to a very broad time period (longer than one day).
- Reference to many people
- Reference to “all”/many places, or reference to a specific place followed by “all the time/a lot/many” etc
- Reference to a group of related things, e.g. “classes”/”grades”
- A generalised characteristic with no reference to time/place/object/person.
- A description of something, but not referring to a *specific* place/person/object.
- Can include reference to the “college *experience/life/environment*”
- General thoughts do **not** include reference to “some”, as this does not imply all things. E.g. “Sometimes I find the work very stressful”. Such thoughts were also not included as contextual, as it does not refer to a specific time/event.

Contextual and general thoughts were coded for valence:

*“Positive”:*

Something that makes the person feel good/results in a good outcome – such feelings should be explicitly stated.

*“Negative”:*

Something that makes the person feel bad/results in a bad outcome – such feelings should be explicitly stated.

- Includes “missing” someone/something and “arguments” with someone.

*“Neutral”:*

The person does not indicate whether that particular thing was positive/negative, or refers to factual rather than emotional events/comments.

#### *Coding frame reliability*

Thirty percent of the essays were rated by two coders, both of whom were blind to the experimental condition the essays belonged to. Each thought that met the criteria was coded as contextual or general, and as positive, negative or neutral. If thoughts did not meet the criteria, they were not coded. Therefore, each thought was potentially assigned two coding labels (e.g. *positive contextual*, *negative general*, etc), resulting in six coding combinations. Comparison of the coding combination each thought was assigned by each coder was compared across the essays. High inter-rater reliability was found with a percentage agreement of 82.80% and a Kappa of .77, indicating excellent agreement (Fleiss, 1981).

### ***3.26 Ethical Considerations***

The sad MIP used in this study required several ethical considerations. BDI-II scores were checked before initiation of the MIP. Participants scoring more than 14 were not included in the study. This cut-off was suggested by Watkins et al. (2003) in order to make sure that no one with more than a mild level of depressive symptoms took part in the study (as defined by Beck & Steer, 1987). When participants had finished the study a happy MIP was offered, which involved listening to uplifting music whilst writing about an event where the participant had felt happy. The debriefing sheet participants were given included contact details for the experimenter and her supervisor should they wish to talk about the study or any concerns regarding their mood at a later date. Ethical approval was gained from the UCL Research Ethics Committee prior to carrying out the study.

### ***3.27 Data Handling***

To maximise the likelihood of an increased despondent mood, only participants whose despondency score increased by at least 20 points after the MIP were included in the analyses.

Data from each participant was recorded, coded and analysed using SPSS version 11.5.

The word participants chose to use for five of the Velten prime sentences at the beginning of the scrambled sentence task and four at the end of the task were coded as either an “extreme” choice (“1”) or not (“0”). An “extreme” choice represented the

word that gave the priming sentence a prolonged or exaggerated meaning compared to the other possible word choice. For example, participants could choose between the word “many” (extreme) or “some” (not extreme) in the scrambled sentence “*some of a low opinion people me have many*” (“*many/some people have a low opinion of me*”). Two totals (for sentences at the beginning and the end of the task) were calculated by summing together all the “1s”. These were then converted to percentages as there were a different number of sentences in the beginning and end sets of sentences.

### 3.3 RESULTS

#### 3.3.1 Descriptive Statistics

To ensure that the three groups were comparable with regard to demographic variables and BDI score, comparative analysis using ANOVA for continuous data and Chi Square test for categorical data were conducted (Table 3.2). The mean age, BDI-II score, and number of female and male participants in each group are displayed in Table 3.2.

**Table 3.2:** Age and BDI-II means (standard deviation), and gender distributions across the three groups: unstable, specific and control.

	Group			F/ $\chi^2$	df	p
	Unstable (n = 18)	Specific (n = 18)	Control (n = 18)			
Age (years)	22.56 (2.75)	21.72 (3.16)	22.33 (3.55)	.33	2, 51	.72
Total BDI score	8.89 (9.73)	10.83 (6.36)	7.78 (4.35)	.84	2, 51	.44
Male:Female	6:12	3:15	3:15	1.89	2	.39

Checks for outliers (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile) in each group were carried out on the despondency scores taken after the mood induction (“pre-SST”), after the sentences task (“post-SST”) and after the stream of consciousness task (“post-SCT”). Outlier checks identified three post-SST outliers in the unstable group, one post-SCT outlier in the unstable group, and one post-SST outlier in the control group. Outliers were

converted to maintain the patterns in the data, but to prevent skewness and kurtosis.

This was done by allocating each outlier a score one point above the next highest score (e.g. if the next highest despondency score was 60, a score of 61 was given to the outlier). Descriptive statistics of the three sets of despondency scores (after removal of outliers) for each group can be seen in Table 3.3.

**Table 3.3:** Mean despondency, skewness, and kurtosis scores for the unstable, specific and control groups

<b>Group</b>	<b>Time</b>	<b>Despondent mood score (Std. Dev)</b>	<b>Skewness (Std. err. = .54)</b>	<b>Kurtosis (Std. err. = 1.04)</b>
<b>Unstable</b>	Start	18.06 (18.24)	1.45	2.60
	Pre-SST	52.22 (22.11)	.37	-.86
	Post-SST	29.22 (13.60)	.79	-.61
	Post-SCT	30.33 (18.92)	-.03	-.95
<b>Specific</b>	Start	22.22 (16.82)	.88	.58
	Pre-SST	58.22 (12.87)	.14	-1.19
	Post-SST	46.22 (19.66)	.13	-.84
	Post-SCT	37.61 (21.37)	.35	.14
<b>Control</b>	Start	19.17 (14.88)	.71	-.13
	Pre-SST	52.81 (12.25)	-.04	-1.04
	Post-SST	42.83 (16.92)	.05	-.48
	Post-SCT	39.44 (24.37)	.60	-.26

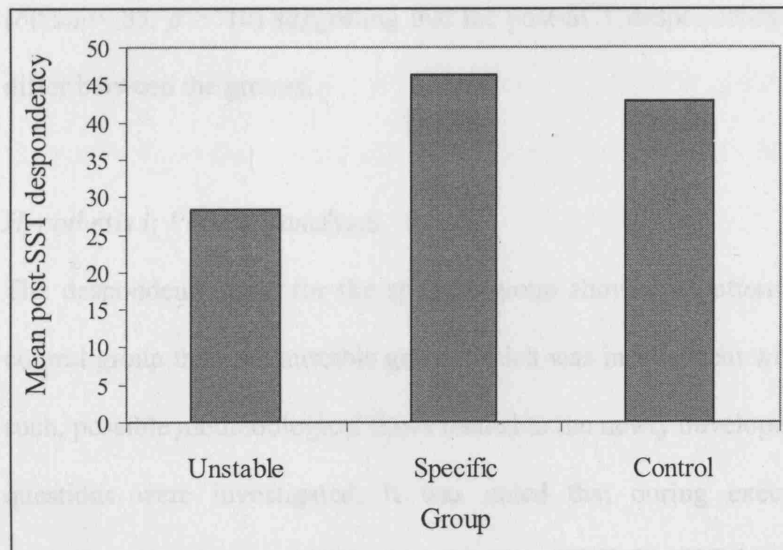
Compared to pre-SST mood, mean post-SST scores suggest a decrease in despondency in all groups, with the biggest decrease in the unstable group and the smallest decrease in the control group. Post-SCT despondency scores show less variation, with mood changing very little in the unstable group, but decreasing in the specific and control groups.

### 3.32 Hypothesis testing

*Hypothesis i:*

*Despondent mood will be significantly lower in the unstable and specific groups than the control group after the scrambled-sentences task.*

Differences between the post-SST despondency scores between the groups were investigated using a three-way ANCOVA. Each group started from a different mean pre-SST despondency score. To control for this difference, pre-SST despondency was included as a covariate in the analysis. The inclusion of the pre-SST despondency score as a covariate allowed for the isolation of the group factor above and beyond the initial mood score. The ANCOVA yielded a significant main effect of group ( $F_{(2,50)} = 5.39, p < .01$ ; Figure 3.1).



**Figure 3.1:** Mean post-SST despondency scores for each group: unstable, specific and control



To investigate the differences between the groups' post-SST despondency scores, independent-samples  $t$  tests were carried out. The alpha level was adjusted to control for type I errors. Analyses revealed a significant difference between post-SST despondency between the unstable and specific groups ( $t_{(34)} = -3.19, p < .01$ ); between the unstable and control groups ( $t_{(34)} = -2.86, p < .01$ ); but not between the specific and control groups ( $t_{(34)} = .55, p > .10$ ).

As post-SCT despondency scores show a similar pattern to post-SST despondency, a three-way between-subjects ANCOVA was carried out on the groups' post-SCT despondency scores (including pre-SST as a covariate). This was to see whether the unstable group continued to show a significantly lower despondency level at the end of the study than the specific and control groups. A significant difference was not found ( $F_{(2,50)} = .83, p > .10$ ) suggesting that the post-SCT despondency did not significantly differ between the groups.

#### *Hypothesis i: Post-hoc analyses*

The despondency data for the specific group showed a pattern more similar to the control group than the unstable group, which was inconsistent with the hypothesis. As such, possible methodological flaws related to the newly developed specific-contextual questions were investigated. It was noted that during execution of the study, participants in the specific group appeared to find the SST harder than the unstable group (as they took longer to finish the task). Transcripts from the SST were analysed for mistakes made in unscrambling the unstable- and specific-contextual questions. Each participant was given one mark every time one of the following mistakes was

made: question unscrambled to give a stable or global meaning; question not unscrambled; question unscrambled, but did not make sense. Total mistakes scores were analysed between the unstable and specific groups via a  $t$  test ( $t_{(33)} = -3.064$ ,  $p < .01$ ). This suggests that more mistakes were made in unscrambling the specific-contextual questions (mean mistakes made = 1.89) than the unstable-contextual questions (mean mistakes made = .76), indicating that participants found the specific questions harder to unscramble.

To investigate whether sentence difficulty acted as a confounding factor, a 2-way ANCOVA between the unstable and specific groups' post-SST scores was carried out with mistakes and pre-SST despondency as covariates. A significant main effect of group ( $F_{(1, 32)} = 5.96$ ,  $p < .05$ ), suggesting that despondency in the unstable group (adjusted despondency mean = 29.28) was still significantly lower than that of the specific group (adjusted despondency mean = 45.17). This implies that the difficulty of the sentences in the specific group cannot solely account for the smaller decrease in despondency identified. However, when a two-way ANCOVA was carried out with only pre-SST despondency as a covariate, the  $F$  value increased ( $F_{(1, 32)} = 8.74$ ,  $p < .01$ ) suggesting that sentence difficulty had a weak effect on the results.

*Hypothesis ii:*

*Participants' despondency will be affected by the number of extreme versions of Velten primes unscrambled*

The word participants chose to unscramble the first five and last four Velten primes in the SST was investigated. The mean percentage of extreme choices made by

participants in each group at the beginning and end of the SST is displayed in Table 3.4.

**Table 3.4:** Mean percentage of extreme choices in each group at the beginning and end of the sentences task

Group	Mean % of extreme word choices made (Std. Dev.)	
	Time	
	Beginning of SST	End of SST
<b>Unstable</b>	21.11 (17.45)	38.89 (24.59)
<b>Specific</b>	27.78 (22.90)	43.06 (25.45)
<b>Control</b>	17.78 (16.65)	40.28 (27.30)

The mean scores in Table 4 indicate an increase in extreme word choice at the end of the SST in all three groups, with a similar rate of increase in choice between the groups. A repeated measures ANCOVA was carried out with time (beginning SST, end SST) as the within-subjects factor and group (unstable, specific, control) as the between-subjects factor. Pre-SST despondency was again included as a covariate. A significant main effect of time ( $F(2, 50) = 13.23, p < .01$ ) was found, suggesting that significantly more extreme words were chosen at the end of the SST. There was no significant main effect of group ( $F(2, 50) = .672, p > .05$ ), and no significant interaction between group and time ( $F(2, 50) = .041, p > .05$ ).

To see whether word choice was associated with despondency scores, Pearson correlations were carried out between despondency (pre- and post-SST) and extreme word choice (beginning and end of SST). This tested whether the participants that started off more despondent were the same ones that chose more extreme words at the

beginning of the SST (and vice versa). Results of these correlations are displayed in Table 3.5.

**Table 3.5:** Pearson's correlations between despondency and extreme word choice

Time	Extreme word choice	
	Beginning of SST $r(p)$	End of SST $r(p)$
Pre-SST	.20 (.15)	-.17 (.227)
Post-SST	.36 (.01)*	.33 (.02)*

\* Significant at  $p < .05$

The results in table 3.5 indicate that significant correlations were found between post-SST despondency and word choice at the beginning and end of the SST. The correlations suggest that the more extreme word choices made at the beginning and at the end of the SST, the more despondent participants were after the task. Correlations within the despondency and choice variables were also carried out, both of which were significant: pre- with post- despondency ( $r = .39, p < .05$ ); beginning with end extreme word choice ( $r = .35, p < .05$ ). These correlations suggest that the more despondent participants were before the SST, the more despondent they were after; and the more extreme choices they made at the beginning of the SST, the more extreme choices they made at the end of the SST.

*Hypothesis iii:*

*Participants in the unstable and specific groups will produce more contextual compared to general thoughts during the stream of consciousness task than the control group*

SCT transcripts were analysed for contextual and general thoughts. Thoughts were also coded as neutral, negative or positive. Contextual thoughts were those that referred to a particular event/person/object in a specific place and/or occurring at a specific time (no longer than one day). General thoughts referred to non-specific/groups of event(s)/people/object(s) with no direct reference to a particular time/place. The percentage of each thought type relative to the total number of thoughts recalled was calculated for each participant. A summary of the mean number of each thought type for each group is displayed in Table 3.6 below.

**Table 3.6:** Mean percentages of each thought type recalled by the unstable, specific and control groups

<b>Thought code</b>	<b>Unstable</b>	<b>Group Specific</b>	<b>Control</b>
<b>Neutral contextual</b>	18.39 (23.78)	20.28 (13.84)	17.08 (16.60)
<b>Neutral general</b>	42.88 (48.63)	39.37 (27.64)	36.04 (21.75)
<b>Negative contextual</b>	5.89 (8.21)	8.46 (12.99)	3.19 (4.88)
<b>Negative general</b>	22.66 (23.66)	21.28 (21.33)	18.24 (22.82)
<b>Positive contextual</b>	4.20 (10.72)	1.03 (2.39)	3.91 (6.31)
<b>Positive general</b>	10.81 (15.54)	8.98 (9.76)	12.78 (18.42)

Skewness and kurtosis scores suggested that the data were not normally distributed. To correct for this the log of each score was taken. A repeated measures ANOVA was carried out with group (unstable, specific, control) as the between-subjects factor, and code (contextual, general) and subtype (neutral, positive, negative) as the within-subjects factors to investigate whether the unstable and specific groups produced more contextual and fewer general thoughts than the control group. No significant

interactions were found between group and code and/or valence (largest  $F < 1$ ) suggesting that there were no differences between the groups in the type of thoughts recalled.

### ***3.33 Additional analyses***

Although only included so as to disguise the experimenter's interest in despondent mood, equivalent analyses investigating the effects the unstable-contextual, specific-contextual and control questions on mood were carried out on the happy and anxious mood data.

#### ***Happy mood analyses***

Outlier checks identified two post-SCT outliers in the unstable group, one pre-SST outlier in the specific group, and six pre-SST outliers in the control group. Outliers were converted using the same method as for despondent outliers. Mean happiness scores for each group, after removal of outliers, and skewness and kurtosis scores are displayed in Table 3.7.

A three-way ANCOVA was carried out between the groups' post-SST happiness scores, including pre-SST happiness as a covariate ( $F_{(2, 50)} = .25, p < .10$ ). The non-significant result suggests that the groups did not significantly differ in their post-SST despondency scores. A second three-way ANCOVA (with pre-SST happiness as a covariate) between the groups' post-SCT happiness scores also did not reveal a significant difference between the groups ( $F_{(2, 50)} = .21, p < .10$ )

**Table 3.7:** Mean happiness, skewness, and kurtosis scores for the unstable, specific and control groups

Group	Time	Happy mood score (Std. Dev)	Skewness (Std. err. = .54)	Kurtosis (Std. err. = 1.04)
<b>Unstable</b>	Start	62.22 (20.09)	-1.33	1.86
	Pre-SST	36.39 (20.28)	-.11	-1.01
	Post-SST	44.17 (15.55)	-.80	.18
	Post-SCT	47.78 (17.96)	.36	-.36
<b>Specific</b>	Start	63.17 (14.63)	-.87	-.05
	Pre-SST	28.22 (14.94)	.67	-.73
	Post-SST	37.50 (18.25)	.28	-.54
	Post-SCT	42.72 (22.32)	-.05	-1.43
<b>Control</b>	Start	60.28 (16.76)	-.36	.30
	Pre-SST	22.00 (8.82)	-.21	-1.24
	Post-SST	30.00 (22.82)	.85	-.04
	Post-SCT	35.44 (23.52)	.09	-1.58

#### *Anxious mood analyses*

As for despondent and happy mood, outliers were identified and converted. Checks revealed one pre-SST outlier in the unstable group. Table 3.8 displays the mean anxiety scores, and skewness and kurtosis scores in each group.

Two three-way ANCOVAs, including pre-SST anxiety as a covariate, were carried out; one on the groups' post-SST anxiety scores and one on the groups' post-SCT anxiety scores. Neither ANCOVA revealed a significant difference between the groups (post-SST:  $F_{(2, 50)} = 1.43, p > .10$ ; post-SCT:  $F_{(2, 50)} = .35, p > .10$ ).

**Table 3.8:** Mean anxiety, skewness, and kurtosis scores for the unstable, specific and control groups

<b>Group</b>	<b>Time</b>	<b>Anxious mood score (Std. Dev)</b>	<b>Skewness (Std. err. = .54)</b>	<b>Kurtosis (Std. err. = 1.04)</b>
<b>Unstable</b>	Start	24.44 (21.07)	.52	-1.06
	Pre-SST	28.94 (25.93)	.90	-.17
	Post-SST	23.33 (18.31)	.20	-1.44
	Post-SCT	23.06 (19.41)	1.02	.44
<b>Specific</b>	Start	27.50 (20.16)	.48	.28
	Pre-SST	30.00 (23.33)	.32	-1.12
	Post-SST	30.17 (29.28)	.47	-.53
	Post-SCT	28.44 (22.88)	.48	-1.16
<b>Control</b>	Start	28.50 (24.60)	.79	.12
	Pre-SST	37.50 (18.17)	-.17	-1.08
	Post-SST	34.44 (22.55)	.02	-1.05
	Post-SCT	30.83 (24.33)	.40	-.70



### **3.4 DISCUSSION**

The current study investigated the effects of contextual prompts on experimentally-induced despondency. The main aim of this study was to replicate Watkins et al.'s (2003) finding, supporting the notion that contextual processing can reduce the effects of negative primes on despondent mood. The current study expanded on Watkins et al.'s study by introducing a second form of contextual processing and investigating whether similar effects on despondency could be achieved. This was investigated by looking at the effects of three scrambled sentences tasks (SST), which contained either specific-contextual questions, unstable-contextual questions, or control questions on participants' despondency ratings.

Analysis of despondent mood ratings between the groups revealed that the unstable group reported a significantly lower level of despondency after the SST than the control and specific groups. This pattern was not maintained after the SCT, with no significant difference between the groups' post-SCT despondency scores. The significantly lower post-SST despondency reported by the unstable group essentially replicates Watkins et al.'s (2003) findings. In the present study, compared to pre-SST despondency, the unstable group's despondency level was reported to be 23 points lower after the SST, compared to 24 points in the Watkins et al. study. The control group in the present study reported post-SST despondency to be 10 points lower than pre-SST despondency compared to six points in the Watkins et al. study. However, inconsistent with the first hypothesis, the specific group did not show a significantly lower level of despondency than the control group. This may partly be attributed to the difficulty of the specific group's SST. The specific questions were newly designed for

this study. During the study it was noted that participants in the specific group took longer to unscramble their sentences. Analysis of mistakes made unscrambling the contextual prompts between the unstable and specific groups showed that significantly more mistakes were made by the specific group. When number of mistakes made was included as a covariate the  $F$  value of the group by mood interaction decreased. This suggests that sentence difficulty may have affected despondency scores. Participants in the specific group may not have been able to process the meanings of the specific-contextual questions as thoroughly as the unstable group. This would result in the specific-contextual questions having less of an affect on despondency.

As speculated, changes in despondency were systematically related to the version of the Velten prime unscrambled, with more extreme choices being related to higher levels of despondency after the SST. However, it is unlikely that this could fully explain the results of the current study because an equivalent number of extreme choices were made between the groups. Nevertheless, interpretation of future work may be made easier if sentences can only be unscrambled in one way, or in ways that are equal in valence.

Analysis of happy and anxious mood scores showed no significant differences between the three groups' post-SST mood scores, suggesting that the SST directly affected despondency rather than mood in general. Similarly, there were no significant differences between the groups' post-SCT mood scores (including despondency). This is not that surprising, as participants were not naturally despondent; therefore any mood effects induced by the MIP and Velten primes are likely to wear-off by the end

of the study. The despondency results are consistent with the proposition that negative events and moods prompt a competition for retrieval among relevant generalised and contextual representations, with the retrieval of contextualised representations limiting the activation of negative mood (Brewin, 1989, 2006). Further support for this explanation is demonstrated by Watkins, Teasdale and Williams (2000), in which a similar experimental manipulation was used to reduce overgeneral memory (OGM) retrieval. As discussed in the literature review (Chapter One), OGM is also characteristic of depression. Using the AMT, participants were asked to retrieve specific autobiographical memories before and after unscrambling either the unstable-contextual or control questions used in the present study. Fewer OGMs were recalled by participants who unscrambled the contextual questions compared to those who unscrambled control questions, independent of changes in mood. This supports the proposition that the SST affects mood through manipulation of contextual processing. Future studies can strengthen this argument by showing that negative mood can be increased by prompting generalised processing, and hence retrieval of OGMs, relative to a control condition.

The aim of the current study was to provide further support for the mechanism proposed in DRT, by directly testing differences between the groups in the activation of the number of contextual and general representations. Contrary to prediction, no significant differences in the number of contextual or general thoughts between the groups were found. On reflection, a SCT may not be the optimum method of thought measurement. The SCT did not explicitly tell participants what to write about, they were simply told *“to write down what ever thoughts came in to their heads whilst*

*listening to the music*". This resulted in very random thoughts, often without a theme, and differing greatly between participants. An alternative task using think-aloud or structured protocols, such as that in Chapter Two, which asked participants to write about a particular topic, may yield differences in thoughts between groups, providing a stronger test of the theory.

A further limitation of this study was a possible selection bias introduced by the fact that only 61% of volunteers showed a substantial increase in despondency after the mood induction procedure. This problem could be overcome by using a more effective mood induction procedure. In addition, the procedures need to be carried out on at least moderately depressed volunteers to see whether the contextual questions would have the same effect on naturally occurring depressed mood.

The results from this study suggest that exposing participants to prompts in the form of unstable-contextual questions can reduce experimentally-induced despondent mood. This finding replicates that of Watkins et al. (2003). Attempts to develop a set of specific-contextual questions that are also capable of reducing despondency were not successful. Chapter Four will address the limitations of the present study in an attempt to provide further support for the results presented here, and hence support the use of priming procedures to manipulate contextual processing and despondent mood.

## **CHAPTER 4**

### **EFFECTS OF CONTEXTUAL QUESTIONS ON EXPERIMENTALLY INDUCED DESPONDENCY: PART II**

This study is a follow-up to that in Chapter Three, which successfully replicated Watkins, Teasdale and Williams' (2003) findings, supporting the suggestion that persistent disorders such as depression depend on generalised negative self-representations that are activated in preference to contextualised negative memories (Brewin, 1989). By exposing participants to contextual questions that placed the current mood within a broader context, previously induced despondent mood was reduced. These results support the mechanism proposed in DRT that negative mood can result from relevant generalised representations winning the competition retrieval over contextual representations, which limit the activation of negative mood. Two extensions to Watkins et al.'s research were made. A second set of contextual questions were developed to encourage specific-contextual processing of mood; and a free-thinking task was added to the end of the study to look at the contextual versus general content of participants' thoughts. Despite replication of Watkins et al.'s results, extension of the research was unsuccessful. The present study addressed the limitations of the previous study and aimed to demonstrate the use of both unstable-contextual and specific-contextual questions in reducing experimentally-induced despondency. In addition, differences between the contextual and control groups in participants' contextualisation of a negative memory were investigated to provide evidence of

contextual processing in the specific and unstable groups. Modifications to the previous study will now be discussed.

The first limitation concerned the effectiveness of the mood induction procedure (MIP). To be included in the study, an increase in despondent mood of at least 20 points (as suggested by Watkins et al.) on a visual analogue scale (VAS) was required. This increase was only reported by 61% of volunteers, suggesting that a more efficient MIP is needed. The previous study used the MIP Watkins et al. (2003) used: Participants wrote about a time when they had felt depressed and low whilst listening to a piece of music by Prokofiev ("Russia under the Mongolian Yoke").

A meta-analysis of the effectiveness and validity of MIPs by Westermann, Spies, Stahl and Friedrich (1996) suggested that film MIPs are more effective. Westermann et al. considered 250 effects of 11 positive and negative MIPs in their review. The MIP with the largest effect size was the film procedure with instruction to get in to a sad mood ( $r_m = 0.74$ ). The music procedure with instruction had a lower effect size of  $r_m = 0.50$ . Although their study identified the film procedure as the most effective at inducing a sad mood, it did not examine which film should be used.

Gross and Levenson (1995) developed a list of 16 films that successfully elicited various emotional states including sadness. Gross and Levenson selected film clips from over 250 films to an ethnically diverse sample of 494 English-speaking participants. Participants completed a 16-item emotion self-report inventory after each film, where they indicated how much of a number of emotions (e.g. amusement, anger

and sadness) they felt after watching the clip. Scores were used to select the two most successful films for inducing each emotional state. The clip suggested to be best at inducing sadness was from the film *The Champ*. The efficacy of *The Champ* at inducing a sad mood has also recently been endorsed by Hewig et al. (2005). As such, the present study used the suggested clip from *The Champ* for the MIP.

The second modification to the study is to the set of specific-contextual questions developed in the previous study. A closer look at the results indicated that participants made significantly more mistakes when unscrambling the specific-contextual questions compared to the unstable-contextual questions used by Watkins et al. (2003). The difficulty of the specific questions resulted in several participants being unable to unscramble some of the questions to make a meaningful sentence, or unable to unscramble them to give a question that encouraged contextual processing. The specific-contextual questions were re-phrased and piloted to ensure that they could be unscrambled successfully for this study. To prevent further mistakes, the extra word added to each sentence to give participants the impression that the version of the sentence unscrambled was of interest, was deleted. The previous study showed that some participants tried to use all the words presented when unscrambling sentences or did not use enough words as they were asked to “use as many words as possible” to unscramble the sentences. By removing the extra word, participants could be told to use all the words presented, avoiding such mistakes. Removing the extra word also removed the potential confounding effect identified in Chapter Three, of participants unscrambling more or less extreme versions of the Velten primes.

The final modification was to the free-thinking task at the end of the study. Differences in context and generality of participants' spontaneous thoughts were investigated between the control and contextual groups. However, the task was too vague, resulting in random thoughts that were difficult to code. More successful coding of thoughts was achieved in the study presented in Chapter Two, which coded data from Rude et al.'s (2004) study. Never-depressed, formerly-depressed, and currently-dysphoric students' thoughts and feelings about starting college were coded for valence, context, generality and as a thought or memory. Although transcripts were coded successfully, the topic biased students to write generally as it did not refer to a specific time period. Therefore, the writing task for the present study asked participants to write freely about a particular topic, but asked participants to remember a particular event so that the time period participants referred to was more specific.

The theoretical justification for this study echoes that of the previous study. Contextual information is encoded with each specific experience. However, if there are large numbers of similar experiences a generic or generalised representation is automatically formed that retains what is common but omits specific contextual details. Both specific and generalized representations may be activated by subsequent similar experiences, resulting in intrusive cognitions, emotions, and behaviours. For example, depressed patients who have a history of repeated adversity may experience general decontextualised thoughts such as "I'm useless" or "No one likes me" in situations of comparatively minor discomfort or disappointment. This overgeneralisation is a well-established feature of depressive thinking.



Brewin (1989) presents a theory of the relationship between cognition and emotion. Two separate stores for memory representations are proposed: one containing verbally accessible memories (VAMs), and the other containing situationally accessible memories (SAMs). VAMs are associated with a person's conscious experience of an event, and can be accessed and manipulated voluntarily. VAMs are used to interpret and classify the meanings of situations using information from long-term memory, and involve the processing of the context of situations. SAMs include the nonconscious summaries of related past experiences, which do not contain contextual information. SAMs are triggered by physical features or meanings of a current event matching an original emotional event causing automatic activation of cognitive, emotional and behavioural representations. In relation to emotional disorders, the activation of a SAM may automatically trigger negative intrusive thoughts or images. This could activate further SAMs and contribute to the development and/or maintenance of an emotional disorder (Brewin, 1989).

Therefore by becoming aware of the wider context relevant to the meaning of a situation, activation of SAMs should be reduced. The aim of the contextual questions in the SST is to increase participants' awareness of the wider context relevant to the meaning of the current situation. By putting their current mood in to context, it is predicted the priming of negative thoughts by the Velten statements will be limited, thereby reducing their activation of negative mood.

The hypotheses for this study correspond to those of Chapter Three:

- i. Despondent mood will be significantly lower after the scrambled sentences task in the unstable and specific groups compared to the control group
- ii. Participants in the unstable and specific groups will produce more contextual compared to general utterances during the writing task than the control group.

## **4.2 METHOD**

### ***4.21 Participants***

Seventy-six volunteers responded to an advert placed on the UCL online psychology subject pool. Participants were screened for depression using the Beck Depression Inventory (BDI-II; Beck et al., 1996a). For ethical reasons, participants showing a mild level of depression or greater (those who scored  $\geq 14$ ) were not included in the study (mean BDI score = 7.07). This left 60 participants in the study (44 females, 16 males), with an age range between 18 and 43 years old (mean = 22.41 years old).

### ***4.22 Design***

An independent samples design was used, with participants randomly allocated to either the unstable, specific or control group. The questions participants unscrambled in the SST (whether unstable-contextual, specific-contextual, or control) acted as the independent variable. The dependent variables were the despondent mood ratings recorded at various points throughout the study, and the number of each type of utterance produced during the writing task (see coding criteria in Chapter Three for details).

### ***4.23 Materials***

Only materials that differ to those in Chapter Three will be discussed in detail. For details of the other materials, please refer back to the method section in Chapter Three.

1. *Self-report mood measure* (Appendix O). Participants rated how despondent, happy and anxious they felt on three visual analogue scales (VASs) ranging from 0 *I do not feel at all X* to 100 *I feel extremely X*.
2. *The Beck Depression Inventory* (BDI-II; Appendix J). The BDI-II (Beck *et al.*, 1996a) was completed by all participants as a measure of depression.
3. *Mood Induction Procedure* (MIP). Participants watched a ten minute clip from the film *The Champ*. This clip has been identified as an effective inducer of sad mood (Gross & Levenson, 1995; Hewig *et al.*, 2005). Participants were told that the purpose of this clip was to induce a sad mood, but given no further instruction.
4. *Scrambled sentences task* (SST). Participants unscrambled 32 sentences (Appendix L), 23 of which were negative self-referent statements (Velten, 1968), which acted as mood maintaining primes. The other nine sentences were prompts in the form of scrambled questions, which acted as the independent variable in each group: there was a control set, an unstable set and a specific set. The unstable and control questions were the same as those presented in Chapter Three. The specific questions were modified and piloted to make sure that they could be unscrambled successfully. Table 4.1 displays the original specific-contextual questions used in the previous study and the new specific-contextual questions used in the present study.

**Table 4.1:** Comparison of the original and new specific questions for the scrambled sentences task

Original specific-contextual questions	New specific-contextual questions
What different views of myself do I have in different situations?	Do different circumstances affect my view of myself?
How much does a feeling transfer from one event to other events?	Will this feeling last if events change?
Will this mood change over situations?	What will I think about this once circumstances change?
What will I think about these feelings in different situations?	How many situations does any mood transfer to?
How much do my feelings change in new circumstances?	How does this one situation compare to other situations?
How have my past feelings changed over situations?	Have my past feelings changed with events?
Don't I experience both good and bad situations?	Don't events have both good and bad outcomes?
How important is this relative to different situations?	How important will this seem in different circumstances?
What fraction of me is how I feel in this particular situation?	What fraction of me is how I feel here?

5. *Writing task:* Several possible topics that participants could write about were piloted to see which would encourage both general and contextual thoughts. It was important that the chosen topic generated negative emotions to make the recollections more comparable to the types of spontaneous negative memories and thoughts seen in depressed patients. To reduce the general utterance bias seen in the essays analysed in chapter two, the task asked participants to recall a particular event. The instructions given to participants were as follows:

*Please spend the next 5 minutes writing about a time in your life where you have felt let down or disappointed by someone or something. This could be related to a family member/friend/work colleague, or something that happened at school/work/a party – any time where you felt let down or disappointed.*

*Describe what happened, how you felt at the time and what you did; then write about how you feel about this event now that you look back on it.*

#### **4.24 Procedure**

Participants gave their informed consent after reading an information sheet (Appendix D) about the study, informing them about the MIP. Participants were screened using the BDI and participants scoring 14 or more were excluded from the study. Participants were randomly allocated to a group then completed the first set of VASs followed by the MIP. The second set of VASs was completed, followed by the SST, and then a third set of VASs. The study ended with the writing task and a final set of VASs. Participants were debriefed (Appendix G), offered a happy MIP (a clip from *When Harry Met Sally*, as suggested by Gross and Levenson, 1995, and Hewig et al., 2005) and paid £6 for their participation.

#### ***4.25 Ethical Considerations***

Due to the sad MIP, there were several ethical considerations. As suggested by Watkins et al., participants with a BDI-II score greater than 13 were not included in the study to assure that no one with more than a mild level of depressive symptoms participated (as defined by Beck & Steer, 1987). Participants' despondency ratings were monitored throughout the study, and participants were offered a happy MIP at the end of the study. Contact details for the experimenter and her supervisor were provided on the debriefing sheet given to participants at the end of the study, should participants have any concerns about the study at a later date. Ethical approval for the study was granted by the UCL Research Ethics Committee.

#### ***4.26 Coding and Data Handling***

To maximise the likelihood of an increased despondent mood, only participants whose despondency score increased by at least 20 points after the mood induction procedure were included.

The same coding frame as used in Chapter Three (which was based on that in Chapter Two) was used to code the writing task. Excellent inter-rater reliability was achieved when the frame was used for the study presented in Chapter Two (percentage agreement = 81.80%, Kappa = .80) and Chapter Three (percentage agreement = 82.80%, Kappa = .77). As such, inter-rater reliability was not re-assessed. Participants' essays were divided in to utterances (a subject-verb clause, unless the rest of the sentence was required for the phrase to make sense), and each utterance was coded as

either contextual or general, and being either positive, negative or neutral in valence.

Please see Chapter Three, section 3.25 for the full criteria.

Data from each participant was recorded, coded and analysed using SPSS version 11.5.



## 4.3 RESULTS

### 4.31 Descriptive statistics

To ensure that the three groups were comparable with regard to demographic variables and BDI score, comparative analysis using ANOVA for continuous data and Chi Square tests for categorical data were conducted. The mean age, BDI-II score, and number of female and male participants in each group are displayed in Table 4.2.

**Table 4.2:** Age and BDI-II means (standard deviation), and gender distributions across the three groups: unstable, specific and control

	Group			F/ $\chi^2$	df	p
	Unstable (n = 20)	Specific (n = 20)	Control (n = 20)			
Age (years)	22.45 (3.80)	22.85 (4.18)	21.89 (6.31)	.19	2, 56	.83
Total BDI score	6.20 (3.49)	8.15 (3.22)	6.85 (3.73)	1.62	2, 56	.21
Male:Female	8:12	2:18	6:14	4.75	2	.09

### 4.32 Preliminary analyses

The data from the first SST study (Chapter Three, section 3.3) implied that the specific-contextual questions were more difficult to unscramble than the unstable-contextual questions. As such, it was suggested that the specific group did not show a significantly lower level of post-SST despondency because participants were unable to properly process the specific-contextual questions. For the present study, the specific-contextual questions were modified to make sure that participants could accurately unscramble them. To make sure that the specific- and unstable-questions were equally

easy to unscramble, the number of mistakes made by participants in each group in unscrambling the questions was calculated. Each participant was given one mark every time one of the following mistakes was made: question unscrambled to give a stable or global meaning; question not unscrambled; question unscrambled, but did not make sense. An independent-samples  $t$  test was carried out on the mistakes scores between each group. A non-significant  $t$  value was found ( $t_{(37)} = .49, p > .10$ ) indicating that a similar number of mistakes were made by participants in the specific (mean number of mistakes = .60) and unstable (mean number of mistakes = .74) groups when unscrambling the questions. This implies that participants did not find one set of questions harder to unscramble than the other.

#### **4.33 Hypothesis i**

*Despondent mood will be significantly lower after the scrambled sentence task in the unstable and specific groups compared to the control group*

Outlier checks were carried out on the despondent mood scores recorded after the mood induction procedure (*pre-SST*), after the SST (*post-SST*) and after the writing task (*post-writing*). Two outliers (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile) were found: one post-writing outlier in the specific group, and one post-writing outlier in the control group. These were converted to one point above the next highest score to maintain the patterns in the data. Table 4.3 displays mean despondency scores, standard deviations, skewness and kurtosis scores for each group.

**Table 4.3:** Mean despondency scores (standard deviation), skewness and kurtosis scores across the three groups: unstable, specific and control

<b>Group</b>	<b>Time</b>	<b>Despondent mood score (Std. Dev)</b>	<b>Skewness (Std. err. = .51)</b>	<b>Kurtosis (Std. err. = .99)</b>
<b>Unstable</b>	Start	10.90 (11.26)	.88	.49
	Pre-SST	55.60 (18.42)	.12	-1.0
	Post-SST	37.75 (21.24)	-.20	-.55
	Post-writing	29.95 (23.06)	.33	-.80
<b>Specific</b>	Start	11.15 (9.92)	.09	-1.61
	Pre-SST	55.15 (21.94)	.42	-.90
	Post-SST	33.50 (20.01)	.30	.26
	Post-writing	29.00 (21.29)	.48	-.38
<b>Control</b>	Start	5.80 (6.45)	.44	-1.49
	Pre-SST	41.60 (17.86)	.24	-.67
	Post-SST	36.45 (23.52)	.17	-1.37
	Post-writing	30.76 (19.16)	.37	-.07

Skewness and kurtosis scores showed that mood data for each group was normally distributed. A three-way ANCOVA, comparing post-SST despondency scores between the three groups (unstable, specific, control), was carried out on the data. Pre-SST despondency was included as a covariate to control for differences in this measure between the groups. The ANCOVA did not yield a significant difference between the groups ( $F_{(2, 56)} = .38, p > .10$ ). To see whether gender affected the results, a second three-way ANCOVA between the three group's post-SST despondency scores was carried out including pre-SST despondency and gender as covariates. A non-significant result was again revealed suggesting that gender had no affect of the results ( $F_{(2, 56)} = .19, p > .10$ ).

As implied by the similarity in mean post-writing despondency scores of each group, a significant difference of post-writing despondency between the groups was also not found when a three-way ANCOVA was carried out on the data, including pre-SST despondency as a covariate ( $F_{(2, 56)} = .14, p > .10$ ).

#### ***4.34 Overview of the essay data***

Before presenting the analyses for the essay data, some general information about the essay task will be given. Participants were able to follow the task instructions and did not have difficulty thinking of something to write about. Some of the topics participants wrote about were as follows: feeling let down by family members or close friends; feeling disappointed with an ex-boy/girlfriend or about breaking up with a boy/girlfriend; and feeling disappointed in oneself because they had failed at something, e.g. exams. On average, the length of participants' essays in the unstable group was 238.58 words; 237.75 words in the specific group; and 198.43 words in the control group. The length of essays did not significantly differ between the groups, as indicated by a three-way ANOVA ( $F_{(2, 57)} = 1.03, p > .10$ ).

#### ***4.35 Hypothesis ii***

*Participants in the unstable and specific groups will produce more contextual compared to general utterances during the writing task than the control group.*

Participants' essays from the writing task were divided in to utterances, and each utterance coded for positive, negative or neutral valence, and as contextual or general.

Scores for each utterance type for each participant were converted in to percentages of the total number of utterances produced by each participant. Mean group utterance scores are displayed in Table 4.4.

Exploration of the data revealed that the data had both skewness and kurtosis, which could not be corrected through conversion of outliers. A Kruskal-Wallis analysis was carried-out to investigate any differences in utterance category frequencies between the groups. No significant differences were found ( $p > .05$ ).

**Table 4.4:** Group percentage means (standard deviation) for frequency of each utterance category across the three groups: unstable, specific and control

Code	Group		
	Unstable	Specific	Control
Negative contextual	10.82 (9.20)	11.01 (7.77)	10.95 (10.26)
Negative general	21.76 (17.01)	31.95 (21.00)	18.67 (13.04)
Neutral contextual	15.12 (11.05)	14.21 (9.27)	17.00 (13.63)
Neutral general	30.07 (13.68)	20.50 (11.92)	26.71 (14.28)
Positive contextual	0.30 (0.80)	1.13 (2.06)	1.53 (2.09)
Positive general	8.42 (6.91)	9.67 (8.63)	8.67 (10.04)

#### ***4.36 Additional analyses***

Equivalent analyses to those carried out on the despondent mood data were carried out on the happy and anxious mood data. Although only included to distract participants from the focus of the study on despondent mood, these data were analysed to get a more comprehensive view of the mood data.

### *Happy mood data*

Outlier checks (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile) identified one post-SST outlier in the control group. This was converted to one point above the next highest score. Table 4.5 displays each group's mean happiness scores, and skewness and kurtosis scores.

**Table 4.5:** Mean happiness scores (standard deviation), skewness and kurtosis scores across the three groups: unstable, specific and control

<b>Group</b>	<b>Time</b>	<b>Happy mood score (Std. Dev)</b>	<b>Skewness (Std. err. = .51)</b>	<b>Kurtosis (Std. err. = .99)</b>
<b>Unstable</b>	Start	64.00 (19.17)	-.79	2.17
	Pre-SST	40.35 (21.27)	-.02	-.86
	Post-SST	39.40 (20.57)	-.29	-.99
	Post-writing	49.25 (23.97)	.54	-.64
<b>Specific</b>	Start	56.50 (18.93)	-.94	-.03
	Pre-SST	30.00 (18.64)	-.21	-1.5
	Post-SST	39.05 (21.50)	-.01	-1.16
	Post-writing	43.58 (22.54)	-.29	-.91
<b>Control</b>	Start	63.00 (23.08)	-.44	-.59
	Pre-SST	33.00 (26.77)	.46	-.49
	Post-SST	34.90 (28.16)	.57	-.36
	Post-writing	41.82 (32.27)	.49	-.97

Two three-way ANCOVAs were carried out. One between the groups' post-SST happiness scores and one between post-writing happiness scores, including pre-SST happiness as a covariate. Neither ANCOVA yielded a significant result, suggesting

that the groups did not differ in post-SST happiness ( $F(2, 56) = .60, p > .10$ ) or post-writing happiness ( $F(2, 56) = .17, p > .10$ ) .

#### *Anxious mood data*

Checks for outliers identified one pre-SST outlier in the control group, which was converted to one point above the next highest score. Table 4.6 displays each group's mean anxiety scores, and skewness and kurtosis scores.

**Table 4.6:** Mean anxiety scores (standard deviation), skewness and kurtosis scores across the three groups: unstable, specific and control

<b>Group</b>	<b>Time</b>	<b>Anxious mood score (Std. Dev)</b>	<b>Skewness (Std. err. = .51)</b>	<b>Kurtosis (Std. err. = .99)</b>
<b>Unstable</b>	Start	22.75 (23.53)	1.18	.85
	Pre-SST	22.25 (20.87)	.88	-.01
	Post-SST	24.25 (21.84)	.57	-.98
	Post-writing	19.85 (20.19)	1.11	.64
<b>Specific</b>	Start	25.75 (24.24)	.56	-1.05
	Pre-SST	28.50 (18.50)	.73	-.26
	Post-SST	29.15 (24.06)	.54	-1.21
	Post-writing	21.11 (23.57)	.92	-.59
<b>Control</b>	Start	16.85 (17.34)	.78	-.58
	Pre-SST	16.15 (16.93)	.84	-.30
	Post-SST	28.65 (23.08)	.14	-1.54
	Post-writing	20.41 (20.99)	1.16	.83

Two three-way ANCOVAs were carried out. One between the groups' post-SST anxiety scores and one between post-writing anxiety scores, including pre-SST anxiety as a covariate. A significant difference was not found between the groups for post-SST

anxiety ( $F_{(2, 56)} = 2.30, p > .10$ ), but a significant difference was found between post-writing anxiety scores ( $F_{(2, 56)} = 3.39, p < .05$ ). The significant difference between post-writing anxiety scores was surprising, as the mean scores displayed in table 4.6 suggest that the three groups show similar mean post-writing anxiety scores (unstable = 19.85, specific = 21.11, control = 20.41). However, the adjusted post-anxiety scores when pre-SST anxiety is included as a covariate do suggest that the groups are reporting different levels of post-writing anxiety (unstable = 19.41, specific = 15.17, control = 27.57). When a three-way ANOVA is carried out, without including pre-SST anxiety as a covariate, a significant difference is not found ( $F_{(2, 56)} = .02, p > .10$ ). Therefore it can be assumed that the significant difference found by the ANCOVA was as a result of the analysis adjusting for the pre-SST anxiety covariate.



#### **4.4 DISCUSSION**

The present study drew on the limitations discussed in Chapter Three to further investigate the effects of unscrambling contextual prompts on experimentally-induced despondency. Based on a paradigm developed by Watkins, Teasdale and Williams (2003), the effects of two types of contextual questions (unstable-contextual and specific-contextual) compared to control questions on experimentally induced-despondent mood were tested. It was predicted that despondent mood would be significantly lower after the scrambled sentences task (SST) in the unstable and specific groups compared to the control group. A three-way ANCOVA between the three groups' post-SST despondency scores did not support this hypothesis, nor did the results support previous findings. Similarly, there was no significant difference between the groups' post-writing despondency scores, as would be expected from the non-significant difference in post-SST despondency. Possible reasons for the non-significant data reported here will now be discussed.

The present study sought to use an alternative MIP, which would successfully induce despondency in a greater number of participants than was achieved in Chapter Three. A film MIP was chosen as this was considered to be most effective at inducing a sad mood (Gross & Levenson, 1995; Hewig et al., 2005). Although more successful (79% of participants in this study showed an increase in despondency by 20 points or more compared to 61% in the previous study), it has since been questioned whether the film MIP induced the right type of despondent mood for this study. Many of the participants commented on how sad they felt for the boy in the clip, implying that their sadness was externally focused, rather than internally focused. van der Does (2002)

compared a music mood induction using Prokofiev's *Russia Under the Mongolian Yoke* played at half speed, to the clip from *The Champ*. van der Does questioned whether the film MIP was appropriate for investigating cognitive dysfunction in depression after a study by Brosse, Craighead and Craighead (1999) failed to find the expected differences in dysfunctional attitudes between previously- and never-depressed participants. van der Does suggested that the film MIP may not be ideal when investigating cognition in depression as the scene is not necessarily self-referent. This is in contrast to the music MIP where participants recall a time in their lives where they felt sad whilst listening to the music, which is self-referent and explicitly triggers personal memories. Participants completed the Dysfunctional Attitudes Scale (DAS; Weissman, 1979) before and after each MIP. The DAS measures dysfunctional beliefs thought to be key in vulnerability to depression according to cognitive theory. Although the film induction was significantly more effective in inducing a sad mood, the correlation between change in sadness and change in DAS score was only significant in the music condition, not the film condition. These results suggest that cognitive dysfunctions in depression are more reliably investigated using the music MIP.

Although no significant differences between the groups' mood scores were found, observation of the mean mood scores show an interesting pattern. When pre-SST despondency is not held as a covariate, the difference between levels of pre- compared to post-SST despondency is greater in the unstable and specific groups (mean differences = 17.85 and 21.65 respectively) compared to the control group (mean difference = 5.15). These patterns provide some justification for studying the effects of

the scrambled questions used in this study on experimentally induced despondency using a music MIP.

Similar to the happy and anxious mood data presented in Chapter Three, no significant differences were found between the groups post-SST or post-writing scores. Unlike the patterns in the anxiety data reported in Chapter Three, levels of anxious mood reported tended to be higher post-SST and lower post-writing. It is possible that the participants in the present study were more anxious than those in the previous study and that the impact of the SST on anxiety confounded the contextual questions' effect on despondency. However, this is unlikely as reported anxiety levels in the present study are lower than reported despondency levels.

The second hypothesis was also not supported. It was predicted that participants in the unstable and specific groups would produce more contextual compared to general utterances during the writing task than the control group. Despite modification and piloting of the writing task instructions, inspection of the data suggests that this task is still not an ideal method of measuring contextual and general thinking. As in the study presented in Chapter Two, participants produced notably more general than contextual utterances (negative, positive and neutral). This suggests that despite being asked to describe a specific event, the task still inclined participants to write more generally. Another reason why no significant differences in utterance type were seen between the groups may again be related to the MIP. As suggested, the film MIP may not have induced a self-referent sad mood that triggered memories of past events in participants. As such, participants may have applied the contextual questions they unscrambled to

thoughts and feelings active in relation to the MIP, rather than to thoughts and feelings about their own experiences. If this was the case then it is unlikely that participants would apply contextual interpretations to a personal memory during the writing task.

In conclusion, the data reported in this study did not support the hypotheses. Due to the likelihood that the film induction did not induce a self-referent despondent mood, and based on the previous successes of the unstable-contextual questions in reducing despondent mood compared to control questions, it is felt that another attempt at using the specific-contextual questions is justified. The final study in this series will use the original music MIP described in Chapter Three in conjunction with the SST used in this study to see whether unstable- and specific-contextual questions can reduce despondent mood. As the writing tasks seem to be biasing participants to produce more general utterances, and are complicated and arduous to code, an alternative task will be used in the next study.

## **CHAPTER 5**

### **EFFECTS OF CONTEXTUAL QUESTIONS ON EXPERIMENTALLY INDUCED DESPONDENCY: PART III**

Chapters Three and Four investigated the mechanism by which negative generalised representations can lead to negative mood using a scrambled sentences task (SST) developed by Watkins, Teasdale and Williams (2003). Watkins et al. successfully reduced experimentally-induced despondency using a series of contextual questions, which placed the present mood within a broader context. Consistent with dual representation theory (DRT; Brewin, 1989), these results provide evidence for the notion that negative mood can be the result of the retrieval of negative generalised representations over contextual ones. Chapters Three and Four extended Watkins et al.'s study by adding a second set of specific-contextual questions, which encouraged participants to think of their mood in relation to different events in their lives. These questions were in addition to the unstable-contextual questions, which place mood within the broader context of time, and control questions, which made no reference to the context of the present mood. A writing task was also added after the SST to investigate whether the contextual questions had affected subsequent emotional processing. Results reported in Chapters Three and Four show inconsistencies both between the chapters and with Watkins et al.'s findings. Several methodological limitations were suggested to contribute to these inconsistencies. The current study addressed these limitations with the aim of providing further support for the role of contextual knowledge in reducing despondency.

The findings reported in Chapter Three successfully replicated those of Watkins et al. (2003), showing a significant reduction in despondency after the SST in the unstable compared to the control group. The newly developed specific-contextual questions did not lead to a significant reduction in despondency. Closer inspection of the specific-contextual questions suggested that these questions were harder to unscramble, possibly confounding their effect on despondent mood. The study reported in Chapter Four modified and piloted the specific-contextual questions to eliminate this limitation. However, results from Chapter Four were disappointing, with neither set of contextual questions significantly reducing despondent mood more than the control questions. The mood induction procedure (MIP) was cited as a possible limitation contributing to these results. The music MIP used by Watkins et al. and in Chapter Three, although successful at inducing a despondent mood, was not the most efficient. Only 61% of volunteers showed a substantial increase in despondent mood after this induction. An alternative film MIP was used in Chapter Four. In a meta-analysis of the effectiveness and validity of mood induction, Westermann, Spies, Stahl and Friedrich (1996) found the film MIP to be the most effective. Subsequent research had identified a clip from the film *The Champ* to be the most reliable in inducing despondent mood (Gross & Levenson, 1995; Hewig et al., 2005). Although the film MIP did yield a higher success rate (79% of volunteers showed a significant increase in despondency), it was subsequently felt that the film induced an externally-focused despondent mood.

van der Does compared the musical MIP to the film. Although both procedures were successful in inducing a sad mood in never- and previously-depressed participants,

measures of cognitive change (as measured by the dysfunctional attitudes scale; Weissman, 1979) were only significantly correlated with mood in the music MIP condition. As such, van der Does suggested that the music MIP is more appropriate when studying cognitive dysfunctions in depression.

In addition to investigating the effects of contextual questions on experimentally-induced despondency, Chapters Three and Four also aimed to compare the number of contextual utterances produced by the contextual groups compared to the control group. This was to investigate whether reductions in despondency were due to participants applying more contextual interpretations to their feelings. If, as suggested by DRT, negative mood is the result of generalised representations winning the retrieval competition over contextual representations, this should be evident in descriptions of negative events and feelings when in a despondent mood. After the SST, participants completed a writing task, the content of which was analysed for number of contextual and general utterances. Despite modification and piloting of the writing task, no significant differences were found between the contextual and control groups in either study. An alternative measure of contextual thinking was suggested as participants in both studies, regardless of experimental condition, produced more general than contextual utterances. This suggests that the task may have biased participants to write more generally.

A well-established measure of contextual memory recall is the autobiographical memory task (AMT; Williams & Broadbent, 1986). This measure of the specificity of autobiographical memory requires participants to recall a specific memory in response

to a number of cue words. Memories are analysed by the experimenters for contextual content and coded as either general or specific. Although widely used, as discussed in Chapter Two, general responses on the AMT may not be an accurate reflection of generalized representations in memory. Furthermore, the AMT is only a test of memory specificity, whereas the specificity of participants' current thoughts are also of interest here. If the SST can encourage participants to view their present despondent mood within a broader context, then transfer of this skill to emotional reactions to subsequent negative experiences may be evident.

To investigate this, a mood reflection task (MRT) was developed. Participants were asked to imagine that they had just been told that they had not got a job they had really wanted. They were then asked to rate the accuracy of 12 statements, each describing an emotional response to the news. Responses were phrased as specific-contextual, unstable-contextual, and overgeneral reactions. If the specific- and unstable-contextual versions of the SST were successful in helping participants view their current mood within the broader context of emotions changing over events or time, then compared to the control group, these participants should also be able to put their negative emotional response to the new piece of bad news in to context.

The present study drew on the successes and limitations discussed in Chapters Three and Four to investigate the effects of contextual and control questions on experimentally induced despondency. The mood induction procedure followed that in Chapter Three, whilst the SST was the same as that used in Chapter Four. As a reliable and appropriate test of the application of contextual interpretations of events has not



yet been found, a new mood reflection task was used to investigate this. Based on the literature reviewed in Chapter Three, the hypotheses were:

- i. Despondent mood will be significantly lower after the scrambled sentence task in the unstable and specific groups, but not the control group
- ii. Participants in the unstable and specific groups will respond more contextually on the mood reflection task than the control group.

## **5.2 METHOD**

### ***5.21 Participants***

Ninety-two participants responded to an advert placed on the UCL psychology subject pool website. Of these, sixty-two of the volunteers showed a substantial increase in despondent mood of 20 points or more on the MIP and were included in the study. The sample consisted of 38 females and 24 males, aged between 18 and 66 years old (mean age = 22.52 years). The Beck Depression Inventory (BDI-IA; Beck & Steer, 1993) was used to screen participants for current symptoms of depression. For ethical reasons, participants showing a mild level of depression or greater (those who scored  $\geq 10$ , as defined by Beck & Steer, 1993) were not included in the study (mean BDI = 5.81).

### ***5.22 Design***

An independent samples design was employed, with participants randomly assigned to one of three groups (unstable, specific or control). The type of questions unscrambled in the SST, whether unstable-contextual, specific-contextual, or control, acted as the independent variable. Dependent variables were despondent mood scores and mood reflection task scores.

### ***5.23 Materials***

The present study uses materials described in chapters three and four. Only materials specific to this study will be discussed in detail. For further information please see the appropriate chapter.

1. *The Beck Depression Inventory:* Due to copyright regulations the BDI-IA (Beck & Steer, 1993; Appendix I) was used to screen participants for depression rather than the BDI-II (Beck et al., 1996a), which was previously used. Analogous to the BDI-II, the BDI-IA is a 21-item self-report questionnaire. Participants circled one statement out of four for each item, which best described how they had been feeling over the past two weeks. If two statements equally applied, participants circled the statement with the highest number. Three of the 21 items differ between the BDI-IA and the BDI-II: the BDI-IA contains items corresponding to “body image change”, “weight loss”, and “somatic preoccupation”; whereas the BDI-II contains items on “agitation”, “worthlessness”, and “concentration difficulty”. A further difference is that the BDI-IA only asks about decreases in appetite and sleep, whereas the BDI-II asks participants to indicate whether appetite and sleep have increased or decreased. Beck, Steer, Ball and Ranieri (1996b) compared the BDI-IA and BDI-II using 140 psychiatric outpatients. Comparable levels of internal consistency were found between the two instruments, and all the items on both instruments positively correlated with self-reported depression. Beck et al. (1996b) concluded that a similar pattern of relationships is shown between the BDI-IA and BDI-II with alike psychosocial characteristics.
2. *Self-report mood scales* (Appendix O): As described in Chapters Three and Four, participants rated how despondent, happy and anxious they felt on three visual analogue scales (VASSs) ranging from 0 *I do not feel at all X* to 100 *I feel extremely X*.

3. *Mood Induction Procedure* (MIP): The musical MIP described in Chapter Three was employed for the present study.
4. *Scrambled sentences task* (SST; Appendix L): The modified SST presented in Chapter Four was used in this study. There were three versions of the SST, which corresponded to the three experimental conditions: the unstable group's SST contained unstable-contextual questions amongst the Velten primes (Velten, 1968); the specific group unscrambled specific-contextual questions; and the control group's SST contained neutral questions.
5. *Mood reflection task* (MRT; Appendix Q): This task was developed for the present study. Participants were asked to imagine that they had just been told that they had not got a job that they really wanted and meant a lot to them. They were presented with 12 statements (Table 5.1) and asked, based on their present mood, to rate how accurately each statement reflected what they would think and how they would feel in reaction to this news. Participants rated each statement on a four-point scale where '1' indicated that *this is exactly how I would feel*; '2' that *this is partly how I would feel*; '3' that *this is a little bit like how I would feel*; and '4' that *I would not feel this way at all*. Four statements represented each of the three types of emotional processing: four statements represented a generalised interpretation of their thoughts and feelings to the news (e.g. *I am not surprised I did not get the job, this always happens to me*); four statements represented an unstable-contextual interpretation (e.g. *just because I didn't get the job this time, doesn't mean I won't get it next time*); and four statements represented a specific-contextual interpretation (e.g. *this is a real knock to my confidence, but hopefully I will get a different job soon*).

**Table 5.1:** Mood Reflection Tasks statements

<b>Emotional processing type</b>	<b>Statement</b>
<b>General</b>	<p>I am not surprised I did not get the job, this always happens to me.</p> <p>I never perform well in interviews, I am useless at them.</p> <p>I can see that this rejection is just the beginning, I don't know if I'll ever get a job.</p> <p>I feel like I am going to get rejected by everyone.</p>
<b>Specific</b>	<p>This is a real knock to my confidence, but hopefully I will get a different job soon.</p> <p>When I do get a job, I will forget all about this set back.</p> <p>I really wanted that job, but there are other jobs out there.</p> <p>This is just one set back in my life; I have to remember to take the bad things with the good things.</p>
<b>Unstable</b>	<p>I feel so rejected at the moment, but hopefully I will feel better tomorrow.</p> <p>Perhaps I can learn from that interview and go in better prepared next time.</p> <p>Just because I didn't get the job this time, doesn't mean I won't get it next time.</p> <p>I feel so inadequate at the moment; I need to remember that I don't feel like this all the time.</p>

#### **5.24 Procedure**

After reading an information sheet (Appendix E), participants completed the BDI-IA. Those who scored below ten were allocated to one of the experimental conditions. Participants scoring ten or more took part in the study described in Chapter Seven. Participants completed the first set of mood scales before completing the MIP. Participants then re-rated their mood followed by the SST. After the SST, participants

completed a third set of mood scales, followed by the MRT, and then a final set of mood scales. Participants were offered a happy MIP (see Chapter Three for details) before being debriefed (Appendix G). Participants were given the opportunity to ask questions and paid £6 for their time.

### ***5.25 Ethical considerations***

The UCL Research Ethics Committee was notified of the changes made to the present study from that in Chapter Four, and approval was granted by the committee.

### ***5.26 Coding and Data Handling***

As in Chapters Three and Four, to maximise the likelihood of an increased despondent mood, only participants whose despondency score increased by at least 20 points after the MIP were included.

A MRT score for each participant was calculated by summing participants' responses to each statement. The ratings participants allocated to the general statements were reverse-coded. The minimum possible score was 12 and the maximum was 48. A low score indicated a contextual mood reflection response; a high score indicated a generalised mood reflection response.

Data from each participant were recorded, coded and analysed using SPSS version 11.5.

## 5.3 RESULTS

### 5.31 Descriptive Statistics

To ensure that the three groups were comparable with regard to demographic variables and BDI score, comparative analysis using ANOVA for continuous data and Chi Square tests for categorical data were conducted. The mean age, BDI-IA score, and number of female and male participants in each group are displayed in Table 5.2.

**Table 5.2:** Age and BDI-II means (standard deviation), and gender distributions across the three groups: unstable, specific and control

	Group			F/ $\chi^2$	df	p
	Unstable (n = 20)	Specific (n = 21)	Control (n = 21)			
Age (years)	20.90 (1.77)	22.43 (10.14)	24.14 (7.60)	.97	2, 59	.38
Total BDI score	6.05 (2.72)	5.19 (2.54)	6.19 (3.04)	.79	2, 59	.46
Male:Female	10:10	7:14	7:14	1.59	2	.46

### 5.32 Hypothesis testing

#### *Hypothesis i*

*Despondent mood will be significantly lower after the scrambled sentence task in the unstable and specific groups, but not the control group.*

Outlier checks (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile) were carried out on the mood data for each group. These revealed several outliers in the despondency scores recorded after the scramble-

sentences task (*post-SST* despondency): two in the specific group; one in the unstable group; and two in the control group. Outliers were converted to one point either above or below the next highest or lowest score in the data (depending on whether it was a high or low outlier score). This maintained the patterns in the data whilst preventing skewness and kurtosis. Table 5.3 displays the mean despondent mood scores, skewness, and kurtosis scores for each group at the start of the study, after the MIP (*pre-SST*), post-SST, and after the mood reflection task (*post-MRT*).

**Table 5.3:** Mean (standard deviation) despondency scores, and skewness and kurtosis scores across the three groups: unstable, specific and control

<b>Group</b>	<b>Time</b>	<b>Despondent mood score (Std. Dev)</b>	<b>Skewness (Std. err.)</b>	<b>Kurtosis (Std. err.)</b>
<b>Unstable</b>	Start	11.65 (12.55)	1.29 (.51)	.88 (.99)
	Pre-SST	42.15 (17.84)	.31 (.51)	-1.06 (.99)
	Post-SST	28.00 (17.87)	.50 (.51)	.35 (.99)
	Post-MRT	33.10 (15.76)	-.34 (.51)	-.59 (.99)
<b>Specific</b>	Start	9.24 (9.78)	.55 (.50)	-1.06 (.97)
	Pre-SST	43.14 (16.31)	.13 (.50)	-.77 (.97)
	Post-SST	39.52 (21.62)	.22 (.50)	-.32 (.97)
	Post-MRT	36.90 (20.71)	-.02 (.50)	-1.12 (.97)
<b>Control</b>	Start	13.67 (14.54)	1.04 (.50)	.50 (.97)
	Pre-SST	46.67 (14.78)	-.26 (.50)	.50 (.97)
	Post-SST	33.00 (17.46)	-.07 (.50)	.50 (.97)
	Post-MRT	33.57 (20.07)	-.29 (.50)	.50 (.97)



It can be seen from Table 5.3 that the specific-contextual and control groups are behaving similarly, with an increase in pre-SST despondency, followed by decreases in despondency at each subsequent time point. The pattern of despondency scores in the unstable group shows the largest decrease between pre- and post-SST despondency, and is the only group to show an increase in despondency post-MRT compared to post-SST.

The hypothesis was analysed using a 3-way ANCOVA to investigate the differences between the groups' post-SST despondency scores. Pre-SST despondency was included as a covariate, as each group started from a different mean score. This allowed for the isolation of the group factor above and beyond the initial mood score. The  $F$  value fell just outside of the 0.05 significance level ( $F_{(2, 58)} = 2.97, p = .059$ ). A second three-way ANCOVA including both pre-SST and gender as covariates was carried out to see whether gender had an effect on the results. This yielded a similar  $F$  value ( $F_{(2, 58)} = 3.00, p = .058$ ), suggesting that gender was not affecting the data. Therefore, although the unstable group did show a lower level of post-SST despondency level (mean = 28.00) than the specific (mean = 39.52) and the control (mean = 33.00) groups, this did not quite reach significance.

A three-way ANCOVA was also carried out on the groups' post-MRT despondency scores to check whether despondency at the end of the study differed between the groups. Pre-SST was again included as a covariate. A significant difference was not found ( $F_{(2, 58)} = .45, p > .10$ )

### ***Hypothesis ii***

*Participants in the unstable and specific groups will respond more contextually in the mood reflection task than the control group.*

After reverse-coding responses to the generalised statements, participants' responses were summed to give a MRT score. Table 5.4 displays the mean MRT scores, their skewness and kurtosis, for each group.

**Table 5.4:** Mean MRT scores, skewness and kurtosis across the three groups: unstable, specific and control

<b>Group</b>	<b>Mean (St. dev.)</b>	<b>Skewness (Std. err.)</b>	<b>Kurtosis (Std. err.)</b>
<b>Unstable</b>	24.20 (5.40)	.19 (.51)	-1.19 (.99)
<b>Specific</b>	27.76 (7.28)	.54 (.50)	-1.20 (.97)
<b>Control</b>	25.71 (6.41)	1.18 (.50)	.75 (.97)

The means indicate that all groups scored in the middle of the scale (minimum score = 12, maximum = 48). Skewness and kurtosis scores indicated normal distribution, allowing parametric analyses. A three-way ANOVA between the groups' total MRT scores did not indicate a significant difference ( $F_{(2, 61)} = 1.59, p > .05$ ).

The data were collapsed across the groups, and Pearson correlations were carried out between post-MRT despondent, happy and anxious mood, and total MRT scores (Table 5.5). A significant correlation was found between happiness at the end of the study and total MRT ( $r = -.36, p < .01$ ). As a low total MRT score indicated a

contextual mood response to the statements, and a high score a generalised response, the correlation indicates that participants who responded more contextually were happier at the end of the study.

**Table 5.5:** Correlations between total MRT scores and post-MRT despondency, happiness and anxiety

Data correlated	<i>r</i>
Total MRT and post-MRT despondency	.21
Total MRT and post-MRT happiness	-.36*
Total MRT and post-MRT anxiety	.09

\* Correlation significant at the 0.01 level

### 5.33 Additional analyses

Although only included so as to disguise the experimenters' interest in despondent mood, equivalent analyses were carried out on the happy and anxious mood data.

#### *Happy mood data*

Outliers were defined and converted using the same method as used for despondent mood outliers. Several outliers were identified: five pre-sentences outliers (one in the specific group, three in the unstable group, and one in the control group); one post-sentences outlier in the control group; and three post-MRT outliers in the unstable group. Table 5.6 displays the mean happy mood scores, skewness, and kurtosis scores for each group at each time-point after conversion of outliers.

**Table 5.6:** Mean happy mood scores (standard deviation), and skewness and kurtosis scores across the three groups: unstable, specific and control

<b>Group</b>	<b>Time</b>	<b>Happy mood score (Std. Dev)</b>	<b>Skewness (Std. err.)</b>	<b>Kurtosis (Std. err.)</b>
<b>Unstable</b>	Start	59.95 (20.86)	-1.29 (.51)	.80 (.99)
	Pre-sentences	38.80 (17.33)	-.42 (.51)	-.60 (.99)
	Post-sentences	41.85 (22.21)	-.01 (.51)	.05 (.99)
	Post-MRT	41.40 (19.41)	-.54 (.51)	-.47 (.99)
<b>Specific</b>	Start	54.14 (21.28)	-.94 (.50)	1.63 (.97)
	Pre-sentences	25.86 (20.79)	.23 (.50)	-1.03 (.97)
	Post-sentences	26.90 (24.26)	.84 (.50)	.57 (.97)
	Post-MRT	30.71 (27.49)	.67 (.50)	-.57 (.97)
<b>Control</b>	Start	59.76 (17.28)	.18 (.50)	-.17 (.97)
	Pre-sentences	30.05 (17.90)	-.06 (.50)	-.71 (.97)
	Post-sentences	32.19 (16.41)	-.01 (.50)	-.64 (.97)
	Post-MRT	33.33 (19.71)	.61 (.50)	-.24 (.97)

Patterns in the mean happy mood scores suggest that after an initial decrease in pre-sentences happy mood, all groups show a small increase in post-sentences happy mood. Happy mood in the unstable group shows little change post-MRT, whereas the specific and control groups show a small increase post-MRT.

Two three-way ANCOVAs were carried out on the data. One between the groups' post-SST happiness scores and one between the groups' post-MRT happiness scores. Pre-SST happiness was included as a covariate in both analyses to control for the differences in pre-SST happiness scores between the groups. A significant difference

was not found for either post-SST happiness ( $F(2, 58) = .26, p > .10$ ) or post-MRT happiness ( $F(2, 58) = .02, p > .10$ ), suggesting that happy mood did not significantly differ between the groups.

#### *Anxious mood data*

Identification and conversion of outliers analogous to those for despondent and happy mood were carried out. Two pre-SST outliers were found (one in the specific group and one in the unstable group); one post-SST and one post-MRT outlier was also found in the unstable group. Table 5.7 displays the mean anxious mood scores, skewness, and kurtosis scores for each group at each time-point after conversion of outliers.

The mean anxiety scores do not show much fluctuation in the unstable group. After an increase in post-SST anxiety in the specific and control groups, post-MRT anxiety remains the same in the specific group, and decreases in the control group.

As for the despondent and happy mood data, two three-way ANCOVAs, including pre-SST anxiety as a covariate, were carried out on the groups' post-SST and post-MRT anxiety scores. Neither analysis yielded a significant result (post-SST:  $F(2, 58) = 1.82, p > .10$ ; post-MRT:  $F(2, 58) = .94, p > .10$ ), indicating that anxious mood after the SST and after the MRT did not significantly differ between the groups.

**Table 5.7:** Mean anxious mood scores (standard deviation), and skewness and kurtosis scores across the three groups: unstable, specific and control

<b>Group</b>	<b>Time</b>	<b>Anxious mood score (Std. Dev)</b>	<b>Skewness (Std. err.)</b>	<b>Kurtosis (Std. err.)</b>
<b>Unstable</b>	Start	22.05 (23.66)	1.58 (.51)	2.39 (.99)
	Pre-sentences	21.80 (17.88)	.59 (.51)	-1.05 (.99)
	Post-sentences	19.00(15.65)	.61 (.51)	-.18 (.99)
	Post-MRT	21.15 (18.42)	.86 (.51)	.20 (.99)
<b>Specific</b>	Start	23.81 (18.77)	.46 (.50)	-1.08 (.97)
	Pre-sentences	27.43 (20.43)	.16 (.50)	-1.39 (.97)
	Post-sentences	30.95 (23.64)	.58 (.50)	.19 (.97)
	Post-MRT	30.24 (19.52)	.23 (.50)	-1.39 (.97)
<b>Control</b>	Start	17.00 (15.67)	.77 (.50)	-.53 (.97)
	Pre-sentences	29.29 (21.70)	.44 (.50)	-.76 (.97)
	Post-sentences	32.14 (20.22)	.24 (.50)	-.56 (.97)
	Post-MRT	26.90 (17.28)	.22 (.50)	-.73 (.97)

## 5.4 DISCUSSION

Building on the paradigms used in Chapters Three and Four, a scrambled-sentences task (SST) was used to test whether prompting contextual processing of negative cognitive primes would limit the activation of despondent mood. According to Brewin's (1989, 1996) dual representation theory, persistent disorders such as depression depend on generalised negative self-representations that are activated in preference to contextualised negative memories. Specific-contextual and unstable-contextual questions were incorporated in to the SST to encourage participants to place their current mood within a wider context. It was hypothesised that despondent mood would be significantly lower after the SST in the unstable and specific groups, but not the control group (who unscrambled questions unrelated to mood). A three-way ANCOVA between the groups' post-SST despondency scores yielded an  $F$  value that fell just outside the 0.05 significance level. Therefore, although the unstable group's despondent mood was considerably lower than the control and specific groups' despondent moods, this difference was not significant. Similarly, a significant difference was not found between the groups' post-MRT despondent mood. Identical analyses to those carried out on the despondency data were carried out on the happy and anxious mood data for completeness. Once again, significant differences were not found between the groups' happy or anxious mood scores post-SST or post-MRT.

It was also predicted that participants in the unstable and specific groups would react more contextually to the mood reflection task (MRT) statements than the control group. An ANOVA was carried out on the MRT statements between the groups. This

analysis was not significant and did not support the hypothesis. Correlations between mood at the end of the study and total MRT score were carried out collapsing the data across the groups. A significant negative correlation between happiness and MRT was found, indicating that participants who responded more contextually to the MRT statements were happier at the end of the study.

As the final instalment of three studies investigating the use of contextual questions on reducing experimentally-induced despondency, it was hoped that this study would have addressed the limitations of the studies reported in Chapters Three and Four, and successfully replicated and extended previous findings. Despite the ANCOVA falling just below the 0.05 significance level, the results do show promise. The unstable group showed a considerably lower level of despondency after the SST compared to the control and specific groups. Therefore, although not significant, these findings do show promise. Surprisingly, the specific group's mean post-SST despondency score was higher than the control group's post-SST despondency score (although not significantly). This pattern of results is similar to that presented in Chapter Three, with the unstable-contextual questions, but not the specific-contextual questions, showing some effect on despondency. Taken together, these findings suggest that the unstable-contextual questions are more effective at encouraging participants to view their mood within a broader context. This may be due to the way memories are stored. As suggested by DRT, SAMs consist of gist information concerning similar events, rather than of events occurring at similar times. As such, it may be easier for participants to think about their mood changing over time, rather than it changing over events, as similar events are stored within the same memory store. Thus unstable memories may



be more susceptible to manipulation than specific memories.

Comparison of mood scores from this study and those reported in Chapter Three present a possible explanation for the non-significant findings. Despondency scores in Chapter Three showed that the unstable group reported a significantly lower level of post-SST despondency compared to the control group. The mean pre-SST despondency scores reported in Chapter Three are at least ten points higher in each of the contextual groups compared to the current study: unstable group's pre-SST despondency is ten points lower in this study; specific group's pre-SST despondency is 15 points lower. There is also a difference, although not as great, between the control groups' scores, with pre-sentences despondency 6 points lower in this study. It is possible that, for the unstable group particularly, where significantly lower levels of post-SST despondency have previously been found, that the level of pre-SST despondency could have confounded any effects of the contextual questions. This possibility is strengthened by the observation that in both the present study and that in Chapter Three, the unstable group's post-SST despondency means are similar (29.22 in Chapter Three and 28.00 in the present study). According to Brewin (1989), negative mood arises when negative overgeneral SAMs are retrieved in preference to contextual VAMs. Watkins et al. (2003) suggest that the lower level of despondency reported by the contextual group but not the control group is due to the contextual questions placing the current mood (and hence any activated SAMs) within a broader temporal context. If such SAMs were not activated by the MIP, possibly indicated by the lower pre-SST despondency scores in this study, then the contextual questions are unlikely to have a significant effect on despondency, and hence a significant difference

between the groups is unlikely.

Implicit of the failure to manipulate mood by priming contextual processing of negative emotion, is the non-significant difference between groups' responses on the MRT. If participants were not applying the contextual questions to their present mood state, it is unlikely that they would then apply them to the negative situation presented in the MRT. Conversely, it is also possible that the MRT is not a reliable or sensitive enough indicator of contextual processing. In support of the MRT, is the reported correlation between happy mood and MRT score when the data was collapsed across the groups. This indicated that participants who were happier were responding more contextually. However, the correlation was weak, and was not mirrored by a positive correlation between despondent mood and MRT score. Had participants in the contextual groups shown a significantly greater post-SST decrease in despondency compared to the control group, use of the MRT could have been more accurately evaluated.

In conclusion, neither the unstable-contextual nor the specific-contextual questions were successful in significantly reducing despondency more than the control questions, although the unstable group's despondency was considerably lower than that of the control and specific groups. The findings suggest that participants are more responsive to the unstable-contextual questions than the specific-contextual questions. This could be due to the questions themselves; or because participants find it easier to consider their mood within the context of time compared to the context of difference events; or possibly a combination of the two – the more abstract specific-contextual questions

made it hard for participants to consider how their mood can change across events. This study points to the potential sensitivity of mood induction procedures, and the temperamental nature of the SST. Despite despondency being successfully manipulated using this task previously by Watkins et al. and in Chapter Three, the second SST study (Chapter Four) was unsuccessful at replicating these results, and the present study only presents weak support for the effectiveness of the unstable-contextual questions. The application of the MRT as a measure of contextual processing can not be determined from this study. As groups did not differ in post-SST despondency, it is unlikely that the contextual groups were utilising the contextual prompts presented in the SST, as such an increase in contextual processing was unlikely. Further development of tasks to assess contextual processing is needed.

The next chapter moves away from exploring the effects of contextual information on experimentally induced mood, and investigates whether naturally occurring despondency can be manipulated through contextual training. Consistent with the SST studies, the following two studies apply the concepts presented in DRT to the development of a new contextual training task.

## **CHAPTER 6**

### **EFFECTS OF TRAINING CONTEXTUAL INTERPRETATION BIAS ON VULNERABILITY TO A MOOD CHALLENGE IN A DYSPHORIC SAMPLE: PART I**

Previous work has suggested that cognitive biases have a causal impact on anxiety. Recent research has concentrated on the application of tasks in reducing anxiety by training individuals to develop a positive bias (e.g., Grey & Mathews, 2000; Mathews & Mackintosh, 2000; MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002; Wilson, MacLeod, Mathews, & Rutherford, 2006). This logic can also be applied to the different types of cognitive bias found in depression, most characteristically, the tendency to overgeneralise negative thoughts and feelings to all situations (Carver & Ganellen, 1983; Carver, Ganellen, & Beharmitrani, 1985). However, it is not clear whether this is a cause or consequence of depression. To investigate the direction of causality between mood and cognition, the present study explores a new way of teaching currently-dysphoric participants to apply contextual interpretations to negative events. The potential of this kind of training method in protecting individuals exposed to triggers that would normally exacerbate a sad mood was also considered.

The importance of teaching depressed participants to incorporate specific contextual information when encoding negative events is implicit in cognitive theories of depression. As well as identifying an excess of overgeneralized thinking, Beck (1983) proposed that depressive disorders depend on “depressive schemas”, which are

negative generalized self-representations in memory such as “*everything I attempt ends in failure*” and “*I am the sort of person everyone laughs at*”. Abramson, Seligman and Teasdale (1978) also related the development of depression to negative self schemas, which lead patients to interpret negative events as being caused by unchanging and pervasive aspects of the self rather than by specific circumstances. Abramson et al. differentiated between two forms of contextual information relevant to causal thinking, one that emphasizes how causes change over time and one that emphasizes how they change over situations. Depression is least likely to develop, they argued, when negative events are explained in terms of causes that are specific to a particular time and situation.

The severity and persistence of depression is also related to negative generalised representations in dual representation theory (DRT; Brewin, 1989, 1996). Specifically, depression is likely to arise through automatic activation of generalized negative situationally accessible memories (SAMs), which contain information about the self. In contrast, overgeneral thinking is limited by verbally accessible memories (VAMs), which even if concerning negative events, contain contextual details.

Derived from DRT, Watkins, Teasdale and Williams (2003) investigated whether the effects of negative mood primes on healthy volunteers could be attenuated by helping participants to access relevant contextual representations. They induced a despondent mood in participants who then completed a scrambled sentences task designed to expose them to additional negative mood primes. In the experimental group, this task simultaneously increased their awareness of a wider temporal and personal context

relevant to their current mood, whereas the control group unscrambled neutral sentences. Compared to the control group, the experimental group reported lower levels of depressed mood after unscrambling the sentences, supporting the idea that greater accessibility of relevant context-rich representations can decrease negative mood.

The aim of the present study was to extend this research by developing a new task that trains participants who are currently-dysphoric to think contextually, by framing negative events within a broader context. The study design was influenced by previous investigations that have successfully manipulated anxiety levels by training individuals to adapt their attentional or interpretive biases (e.g., Grey & Mathews, 2000; MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002; Mathews & Mackintosh, 2000; Wilson, MacLeod, Mathews, & Rutherford, 2006). Previous studies have used student samples without any signs of current anxiety or depression. The use of dysphoric individuals in this study provides an opportunity to develop and test innovative interventions, and to generate preliminary data that can justify future work with distressed patients suffering from more severe conditions.

Participants were asked to read four pre-written diary entries concerning negative events with words omitted throughout. Gaps were filled using words presented in a table underneath the entry. In the experimental (contextual) group, participants were forced to choose contextual words or phrases over general ones. The control group's word/phrase choices were neutral and did not have a contextual or general meaning. Therefore, like the word fragment completion tasks used by Grey and Mathews

(2000), and Mathews & Mackintosh (2000) that induced positive or negative interpretation biases, the diary tasks aimed to induce a bias to contextual interpretations of negative situations in the experimental group. To increase the ecological validity of the diary entries, topics relevant to the participant group (university students) were chosen and written as if by someone who was currently feeling very despondent about their situation.

The diary tasks were followed by a challenging writing task, where participants were asked to recall a negative event. If the diary training tasks were successful in inducing contextual interpretations of negative events in the contextual but not the control group, subsequent recall of a negative event should result in different emotional responses between the groups. Differences in memory recall between the groups will be investigated by coding the essays for contextual and general utterances, using the coding frame described in Chapter Three. Comparisons between the number of contextual and general utterances (positive, negative and neutral) recalled will be made.

This design is similar to MacLeod et al.'s (2002) and Wilson et al.'s (2006). In their studies, after training an attentional bias, participants were exposed to a stress task, which was designed to elicit negative mood. This was to investigate whether attentional training was successful in causing different emotional reactions between participants trained to attend to negative compared to neutral words. In both studies, participants in the negative training condition were found to react more negatively compared to those in the neutral condition, suggesting that emotional vulnerability can

be causally mediated by attentional bias. As such it was predicted in the present study that, after recalling a negative event expected to decrease mood, the mood of participants forced to complete diary entries with contextual words/phrases will be less despondent than that of the control group. As changes in mood were hypothesised to be in reaction to being able to place the recalled negative memory in context, it was predicted that participants in the contextual group will produce more contextual and fewer general utterances than the control group.



## **6.2 METHOD**

### ***6.21 Participants***

Forty currently-dysphoric participants (26 female, 14 male) took part in the study. Presence of dysphoria was assessed via the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996a). Using the criteria proposed by Beck et al. (14-19 mild, 20-28 moderate, and >29 severe), 16 participants fell into the category of mildly depressed, 13 of moderately depressed, and 11 of severely depressed. Participants were recruited via University College London's online subject pool. The age range was between 18-39 years, with a mean of 22.45 years old.

### ***6.22 Design***

An independent groups design was employed, with participants randomly allocated to either the contextual or control group. The independent variable was the type of diary entries participants completed. Participants in the contextual group completed entries that forced participants to give a contextual interpretation to the events; participants in the control group completed entries with neutral meanings, which did not frame the events as contextual or general. Despondent mood scores, recorded throughout the study, and the number of contextual and general utterances recalled during the writing task, acted as the dependent variables.

### ***6.23 Materials***

1. *The Beck Depression Inventory* (BDI-II; Appendix J): The BDI-II (Beck et al., 1996a) was completed by all participants as a measure of depression. This is a

21-item self-report questionnaire. Each item has four numbered statements associated with it. Participants circled the statement that best describes how they had been feeling over the last 2 weeks. If two of the statements equally applied, participants circled the statement with the highest number. Items include sadness, self-criticism and indecisiveness. The BDI-II has been found to be a valid measure of the severity of depression symptoms in student samples (Whisman, Perez, & Ramel, 2000). However, as no clinical assessments of depressive symptoms were completed, the sample will be referred to as *currently-dysphoric*.

2. *Mood scales* (Appendix O): Participants' despondent, happy and anxious mood was monitored throughout the study via three visual analogue scales ranging from 0 ("I do not feel at all X") to 100 ("I feel extremely X").
3. *Diary task*: Four diary entries were written based on themes from essays written by participants of a similar age from a previous study, about a time when they had felt depressed. Themes were taken from these essays to ensure that the diary entries were as realistic and relevant to the current sample group as possible. The themes of the entries were: not enjoying university; a break-up with a boyfriend/girlfriend; hating your job; and finding it difficult as a foreign student at university.

Entries were written with numbered gaps that participants had to fill in. Each gap could be filled with a word or phrase of a corresponding number found in a table under the entry. Participants had to select one of two words or phrases to fill each gap. Participants were told to fill the gap with the word or phrase

containing a capital vowel (e.g. sometimes), not the word containing a capital consonant (e.g. always). For the control group, these words/phrases were all neutral and did not give a contextual or general meaning to the entry. Apart from the word used to fill the gap, the content of the entries did not vary between the two groups. Approximately 60% of the experimental group's words/phrases gave a contextual meaning to the entry; the remaining choices were neutral. By forcing participants to choose contextual words/phrases such as 'sometimes'/'at the moment'/'particular things', rather than general ones such as 'always'/'every time'/'everything', the completed entries emphasized how the events occurred at a specific time and under specific circumstances that could be expected to vary in the future. To make the contextual group process both options but always select the contextual one, the contextual word/phrase was always the second choice and always contained a capital vowel. The neutral choices for this group always contained a capital vowel in the first word/phrase so that participants did not learn to select the second option every time. To ensure that participants fully processed the content of the entry, and to disguise the nature of the task, participants in both groups were asked to read the passage for a second time once they had filled all the gaps and count the number of words throughout the entry with two syllables. The total number of words was recorded at the end of the entry. (See Appendices M and N for contextual and control diary entry examples).

4. *Writing task.* Participants spent five minutes writing about a time in their life when they had felt let down or disappointed by someone or something, describing what happened, what they did, how they felt at the time and how

they feel now they look back on the event. This was included as a challenge task designed to probe their responses to a negative memory that would typically cause a temporary exacerbation of sad mood. Essays were later split in to utterances and each utterance coded as general or contextual, and as being positive, negative or neutral in valence. The essays were coded using the coding frame described in Chapter Three.

#### ***6.24 Procedure***

Prior to starting the study, participants read an information sheet (Appendix D) Immediately after completion of the BDI-II, participants were randomly allocated to either the control or contextual group. Participants completed the first set of mood scales, followed by the four diary entries (in a random order). The second set of mood scales was completed, followed by the writing task. Participants finished by completing a final set of mood scales. All participants were debriefed (Appendix H) and paid £6 for their participation.

#### ***6.25 Ethical considerations***

As this study used currently-dysphoric participants, several ethical issues were considered. All participants were fully debriefed at the end of the study and given an information sheet to take home with them. This sheet provided contact details for the researcher and her supervisor, should participants have any concerns at a later date. Participants whose BDI-II score was in the severely depressed range (scores above 29) were also asked whether they had people they could talk to about their feelings, and

offered contact details of the Depression Alliance organisation and the Samaritans. The study was granted ethical approval from the UCL Research Ethics Committee.

#### **6.26 Data handling**

The same coding frame as described in Chapters Two and Three was used to code the writing task. Participants' essays were divided in to utterances (a subject-verb clause, unless the rest of the sentence was required for the phrase to make sense), and each utterance was coded as either contextual or general, and as either positive, negative or neutral in valence. The number of each utterance type produced by each participant was converted in to a percentage of the total number of utterances recalled. Inter-rater reliability previously achieved for the frame was: The studies described in Chapters Two and Three both achieved excellent levels of inter-rater reliability for the coding frame (percentage agreement > 80%, Kappa > .75), as such, inter-rater reliability was not re-assessed.

Data from each participant were recorded, coded and analysed using SPSS version 11.5.

## 6.3 RESULTS

### 6.31 Descriptive statistics

To check that the groups did not differ on demographic variables, independent samples *t* tests were carried out on the age and BDI-II data, and a Chi Square test on the gender distributions between the groups. Table 6.1 displays the participants' mean age and BDI-II score in each group, the number of male and female participants in each group, and the results of the statistical tests.

**Table 6.1:** Age and BDI-II means (standard deviation), and gender distributions across the contextual and control groups

	Group		<i>t</i> / $\chi^2$	df	<i>p</i>
	Contextual ( <i>n</i> = 20)	Control ( <i>n</i> = 20)			
Age (years)	23.00 (4.94)	21.90 (3.18)	.84	38	.41
Total BDI score	23.25 (8.04)	25.70 (7.77)	-.98	38	.33
Male:Female	8:12	6:14	.44	1	.51

**6.32 Hypothesis i:** *After recalling a negative event expected to decrease mood, the mood of participants in the contextual group would be less despondent than that of the control group.*

The despondent mood data were checked for outliers (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile). This revealed two outliers in the control group: one in despondent mood after the diary task, and one after the writing task. These were converted to one point less than the next

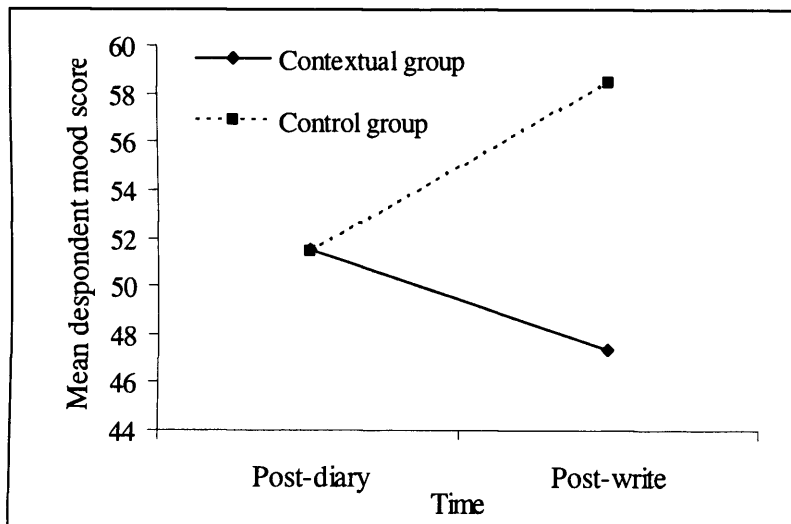
lowest despondent mood score, to maintain the patterns in the data. There was no skewness or kurtosis of the data. Table 6.2 displays the mean despondent mood scores, standard deviations, skewness and kurtosis scores after conversion of outliers, for each group at the beginning of the study (*start*), after the diary task (*post-diary*), and after the writing task (*post-write*).

**Table 6.2:** Mean despondency, skewness, and kurtosis scores for the contextual and control groups

Group	Time	Despondent mood mean (Std. Dev)	Skewness (Std. err. = .54)	Kurtosis (Std. err. = 1.04)
Contextual	Start	47.25 (21.16)	.52	-.72
	Post-diary	53.55 (23.61)	-.06	-.33
	Post-write	48.74 (25.22)	-.09	-1.14
Control	Start	41.90 (20.66)	.07	-1.60
	Post-diary	49.35 (16.09)	.16	-.92
	Post-write	57.09 (16.62)	.29	.00

The mean scores in Table 6.2 suggest that both groups experienced an increase in despondency post-diary, followed by a further increase post-writing in the control group, and a decrease in despondency post-write in the contextual group. A repeated measures ANCOVA was carried out with time (post-diary, post-write) as the within-subjects factor and group (contextual, control) as the between-subjects factor. Despondency at the start of the study was included as a covariate to eliminate any group differences at baseline. The ANCOVA revealed a significant effect of time ( $F_{(1, 37)} = 5.48, p < .05$ ), and a significant interaction between time and group ( $F_{(1, 37)} = 6.04$ ,

$p < .05$ ; see Figure 6.1. (N.B. Figure displays mean scores after adjusting for start despondency covariate.). Simple effects analyses revealed a significant difference between the groups in post-write despondency,  $F_{(1, 37)} = 97.8$ ,  $p < .05$ , and between post-diary and post-write despondency in the control group,  $F_{(1, 37)} = 5.21$ ,  $p < .05$ . These results indicate that the control group's despondency deteriorated significantly after negative memory retrieval, resulting in a significantly higher despondent mood than the contextual group at this point. There was no significant main effect of group ( $F_{(1, 37)} = 1.46$ ,  $p > .05$ ).



**Figure 6.1:** Mean despondency scores post-diary and post-writing for the contextual and control groups

Additional exploratory analyses were carried out on the data to check for any effects of gender or severity of dysphoria. A repeated measures ANCOVA was conducted with group (contextual, control) as the between-subjects factor, and gender (male, female) and time (post-diary, post-writing) as the within-subjects factors. Despondency at the



start of the study was included as a covariate. The results did not reveal any significant main effects of gender ( $F_{(1, 35)} = 1.53, p > .05$ ), or any interactions involving gender (largest  $F_{(1, 35)} = .80, p > .05$ ). In an investigation of the taxometric properties of the BDI-II, Beach and Amir (2006) suggested that there was a discontinuity between college students scoring above and below 21. To see whether more or less severely dysphoric participants performed differently, a repeated measures ANCOVA was carried out with time (post-diary, post-write) as the within-subjects factor, and group (contextual, control) and BDI-II score ( $< 21, > 21$ ) as the between-subjects factors. Start despondency was included as a covariate. There were no main effects of BDI-II score ( $F_{(1, 35)} = .64, p > .05$ ), or any interactions involving BDI-II score (largest  $F_{(2, 70)} = 2.60, p > .05$ ).

### ***6.33 Additional mood analyses***

MANCOVAs looking at the effects of group and time on happy and anxious mood ratings were carried out to get a more complete picture of the effects of the diary entries on overall mood.

#### *Happy mood analyses*

As for the despondency data, outlier checks were carried out on the happy data. Two outliers (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile) were found, both in the control group: one at the start of the study, and one post-diary. These were converted to one point above or below the next highest or lowest score in the data. Table 6.3 presents the mean

happiness scores for each group, and their skewness and kurtosis after conversion of outliers.

**Table 6.3:** Mean happiness, skewness, and kurtosis scores across the contextual and control groups

Group	Time	Happy mood	Skewness (Std. err.)	Kurtosis (Std. err.)
		mean (Std. Dev)		
Contextual	Start	33.60 (20.01)	.33 (.51)	-.63 (.99)
	Post-diary	27.00 (17.04)	-.12 (.51)	-1.10 (.99)
	Post-write	29.47 (18.32)	.15 (.52)	-1.06 (1.01)
Control	Start	38.35 (16.57)	.52 (.51)	-1.03 (.99)
	Post-diary	29.15 (15.04)	-.23 (.51)	-.96 (.99)
	Post-write	27.56 (18.35)	.06 (.54)	-1.15 (1.04)

The mean happiness scores suggest that both groups experience a decrease in happiness post-diary. Post-write, the control group shows a further small decrease in happiness, whereas the contextual group show a small increase in happiness. A repeated measures ANCOVA with time (post-diary, post-write) as the within-subjects factor and group (contextual, control) as the between subjects factor. Happy mood at the start of the study was included as a covariate to isolate any differences between the groups in happy mood at the beginning of the study. No significant main effects of time or group, and no significant interaction was found (largest  $F_{(2, 34)} = .95, p > .05$ ).

### *Anxious mood analyses*

No outliers were found in the anxiety data. The mean anxiety scores for each group, and their skewness and kurtosis are displayed in Table 6.4. Mean anxiety scores show little variation in the control group. The contextual group show an increase in anxiety post-diary, then a decrease post-write. A repeated measures ANCOVA (including start anxiety as a covariate) was conducted with time (post-diary, post-write) as the within-subjects factor and group (contextual, control) as the between subjects factor. No significant main effects of time or group, or a significant interaction between time and group were found (largest  $F_{(2, 34)} = 3.42, p > .05$ ).

**Table 6.4:** Mean anxiety, skewness, and kurtosis scores across the contextual and control groups

Group	Time	Anxious mood		
		mean (Std. Dev)	Skewness (Std. err.)	Kurtosis (Std. err.)
Contextual	Start	49.60 (23.85)	-.12 (.51)	-1.45 (.99)
	Post-diary	50.60 (26.14)	.06 (.51)	-1.42 (.99)
	Post-writing	42.50 (27.75)	.24 (.52)	-1.33 (1.01)
Control	Start	53.40 (29.28)	-.07 (.51)	-.90 (.99)
	Post-diary	53.00 (27.79)	-.26 (.51)	-.67 (.99)
	Post-writing	53.00 (29.63)	-.07 (.54)	-.97 (1.04)

**6.34 Hypothesis ii:** *Participants in the contextual group would produce more contextual and fewer general utterances than the control group*

Each participant's writing-task utterances were coded and the percentage of each type of utterance in relation to the total number of utterances produced by each participant

calculated. Analysis of the distribution of utterance types in each group showed high levels of skewness and kurtosis in the control group on negative contextual, negative general, neutral contextual, positive contextual and positive general utterances, which could not be corrected. From looking at the mean scores (Table 6.5) it can be seen that the contextual and control groups produced similar numbers of each utterance type. Mann-Whitney analyses were carried out to confirm whether there were any differences in utterance type between the groups. No significant differences were found (see Table 6.5).

**Table 6.5:** Mean percentage (standard deviation) of utterance types produced in the contextual and control groups, and comparison of number of utterance types produced by the contextual and control groups: Mann-Whitney U test results

Code	Group		Mann-Whitney U analysis	
	Contextual	Control	<i>U</i>	<i>p</i>
<b>Negative contextual</b>	8.06 (8.22)	8.55 (9.98)	198.50	.97
<b>Positive contextual</b>	0.76 (1.36)	1.08 (2.57)	180.00	.46
<b>Neutral contextual</b>	15.49 (11.37)	15.02 (10.70)	193.50	.86
<b>Negative general</b>	26.01 (13.37)	24.29 (19.40)	162.00	.30
<b>Positive general</b>	5.68 (7.05)	6.11 (7.35)	199.50	.99
<b>Neutral general</b>	27.97 (12.34)	29.24 (15.57)	166.00	.36

## 6.4 DISCUSSION

The present study investigated the effects of a new form of training designed to correct the overgeneralisation bias associated with depression. Contextual training, which encourages participants to see negative events as distinct and temporary, was predicted to reduce despondent responses to negative memories. Dysphoric participants were presented with pre-written diary entries of negative events and completed these with words and phrases that placed the event and feelings towards it in context (contextual group) or with neutral words and phrases (control group). As expected, after describing a negative autobiographical memory, despondent mood was attenuated in the contextual group but not the control group.

Despite the contextual group showing a significantly lower level of despondency after the writing task, no differences were found between the groups in the number of contextual or general utterances (positive, negative or neutral) produced. This was inconsistent with the hypothesis that participants in the contextual group would produce more contextual and fewer general utterances than the control group.

Analysis of happy and anxious mood data revealed no significant main effects or interactions. However, patterns of mean scores are as would be expected. Anxious mood followed the same pattern as despondent mood, with both groups showing an increase in anxiety post-diary. The contextual group then showed a decrease in anxiety post-write, where as the control group's anxiety remained stable post-write. Happy mood mirrored that of despondency, with both groups showing a decrease in happiness

post-diary, followed by a small increase in the contextual group post-write, but a decrease in happiness in the control group post-write.

To my knowledge this is the first study to attempt to train a cognitive bias in a group of dysphoric participants. Consistent with Watkins et al.'s (2003) results, the data suggest that prompting participants to consider negative events and moods within a broader context can have a positive impact on despondency. As proposed by a number of cognitive theories (Abramson et al., 1978; Beck, 1983; Brewin, 1989, 1996; Carver & Ganellen, 1983) these data support the role of generalised thinking or the presence of generalized negative memory representations as risk factor for depression. In addition to using a currently-dysphoric sample, this study presents a new training paradigm that was successfully able to reduce vulnerability to a subsequent trigger for despondent mood.

The increase in mood immediately after the diary task was not surprising. The diary entry themes were taken from essays written by participants from the study described in Chapter Three, which asked them to write about a time where they felt depressed. These themes were chosen to try and expose participants to the types of thoughts and feelings they might experience when feeling depressed. The initial increase in despondency after this task suggests that effects of training were on thinking patterns rather than directly on mood. It was not until after the recall of a negative autobiographical memory that a reduction in despondency in the contextual group was evident. As predicted, the writing task led to significantly worse mood among the controls.

Although despondency was successfully attenuated in the contextual group, the utterances data indicate that the diary tasks did not successfully encourage participants to contextualise their own negative memories. This may have been the result of a limitation in the task instructions. Participants were not explicitly asked to imagine that they wrote the entries themselves or to imagine that the event described in the entry had happened to them. Therefore, although the entries may have subconsciously affected the way participants thought about negative events, participants may not have necessarily applied these interpretations to their own memories. If this was the case, changes in cognition produced by the contextual diary entries would not have emerged in the writing task.

The similarities in contextual and general content of the writing task essays between the groups, although inconsistent with prediction, do present some interesting implications. The data suggest that changes in despondent mood after this task were not due to the groups producing qualitatively different memories: Both groups produced a similar number of negative contextual and negative general utterances, suggesting that the control group's higher despondency level was not due to recall of more negative memories. Similarly, both groups produced a similar number of positive utterances (general and contextual), suggesting that mood differences were not due to the contextual group recalling more positive memories. The greater number of general compared to contextual utterances (positive, negative and neutral) produced by both groups is consistent with theories of depression, which suggest that overgeneralisation is a characteristic feature of depression (Beck, 1967; Abramson et al., 1978) and

depressed mood (Brewin, 1989). Therefore, although not diagnosed as clinically depressed, the content of the currently-dysphoric sample's essays reflect what would be expected to be seen in a currently-depressed sample. Conversely, the tendency to produce more general than contextual utterances was a pattern also noted in the studies presented in chapters Two, Three and Four of this thesis, all of which used participants whom were not depressed. Based on this, the current results can not be used as irrefutable evidence that the depressed are more likely to be overgeneral in their utterances than the non-depressed. An alternative explanation to be considered is that people have a tendency to produce more general than contextual utterances in their narratives. To establish whether this pattern of utterances is merely a reflection of a tendency for narratives to be more general than contextual, rather than a genuine characteristic of depressive thinking, an alternative measure of contextual thinking should be included. An example of such a task is the recognition test used by Mathews and Mackintosh (2000; described below).

The results of the present study are consistent with the effect of techniques for training cognitive biases in relation to anxiety. Mathews and Mackintosh (2000) developed a method of inducing positive and negative interpretative biases, where participants resolved socially ambiguous text by completing a word fragment at the end of the text. Participants were forced to give predominantly positive/neutral or negative emotional meanings to the texts. A recognition test where participants rated how similar subsequent disambiguated sentences were to a new ambiguous test passage was then used to test the effects of training. The results revealed that participants did appear to have acquired a general interpretational bias, and that anxious mood ratings taken



before and after training showed significant changes in anxiety congruent with the direction of training.

Subsequent research by Yiend, Mackintosh, and Mathews (2005) using the same training task also found changes in anxious mood during the study, with negative interpretation training leading to an increase in anxious mood, and positive training to a decrease in anxious mood. However, unlike in the present study, mood differences between the two groups at the end of the study were not significant. They suggested that this may have been because they did not employ a mood challenge of the kind used by MacLeod et al. (2002) and by the current study. These initial results show promise for the application of cognitive bias training to different mood states including anxiety and depression. The application of such training may prove to be a useful tool in treating clinical disorders, particularly if they can be developed to the point where they are able to bring about long-lasting reductions in mood.

Although the data are promising, further development of the task is needed before considering the possibility of incorporating it in to therapy. The present data show that after an initial increase in despondency, unlike the control group whose despondent mood continues to increase, the contextual group's despondent mood returns to base level. The aim of future research should be to reduce the contextual group's despondent mood below the original level, therefore showing an improvement in mood. The period over which any reduction in despondency lasts also needs to be monitored. The next stage in this research should therefore ask participants to complete diary entries and continue to monitor mood over several days. By asking participants

to complete entries over several consecutive days, it is hoped that despondent mood will fall below the original level, and that this reduction in despondency will continue throughout the course of the study. The generalisability of the diary training to individuals with diagnosable disorders also needs to be tested in future studies. Participants in this study were not clinically depressed, although on average participants did report moderate levels of depressed mood comparable to those encountered in primary care (Beck, Steer, & Brown, 1996; Sprinkle et al., 2002). However, when comparing participants who scored below 21 on the BDI to those who scored above 21, analyses indicated that the effects were not restricted to those with mild levels of dysphoria.

When considering potential limitations of the present study, it is important to acknowledge that of including covariates in repeated measures ANOVAs. A covariate that is only measured once does not provide adjustment to a within-subjects effect as the same adjustment is provided for each level of the effect. Therefore, if one wanted to investigate the significance of within-subjects effects at each level, a covariate for each level of the effect would need to be included. There are further more general limitations when including covariates in all types of ANOVAs (and MANOVAs). It is important to interpret adjusted means with caution as they imply that all participants have scored the same on that particular measure. This is unlike to correspond to naturally occurring behaviour. Furthermore, manipulation could lead to under- or over-adjustment of the dependent variable being included as a covariate. To reduce these limitations several rules when choosing a covariate should be considered, all of which were respected during analysis of the present data: there should only be a small

number of covariates; the covariate should be independent of treatment and measured prior to treatment; and participants should be randomly allocated to groups (Tabachnick & Fidell, 2001).

To support the theory that changes in mood are due to changes in the activation of generalized representations rather than demand effects of the study, an independent measure of contextual thinking or contextual memory retrieval needs to be employed. Although the writing task essays were analysed for difference in contextual and general recall, no significant differences were found between the groups. The use of this task as a measure of contextual and general processing was criticised in Chapter Four. As the present study and the study presented in Chapter Four were run concurrently, limitations of the writing task were not evident until after completion of both studies. Subsequent research should aim to develop an alternative task. However, it is unlikely that the findings were a result of demand characteristics as the data suggests that, rather than decreasing despondent mood, the entries immediate effects were to increase despondent mood. It is also unlikely that participants guessed the nature of the diary tasks as the contextual group's entries included neutral foils and participants were not asked to consider the entries when rating their mood. However, it is possible that the task produced changes in other cognitive biases or patterns of thinking, and that these are responsible for the resiliency displayed by the contextual group.

In summary, the results of this study suggest for the first time that knowledge about cognitive biases can be applied to the development of training tasks to manipulate

vulnerable thinking styles in depression. The data add to the growing body of evidence for training tasks incorporating corresponding knowledge about anxiety. Questions concerning the principles that might underlie effective training and how to achieve best results in practice still remain. But, even at this early stage of the research, the theoretical basis of cognitive-behaviour therapy, that thinking styles have a causal impact on mood, is strengthened through the existence of effects such as that found in this study. The next study will make some of the suggested modifications to the paradigm, and attempt to support and extend the findings of the current study.

## **CHAPTER 7**

### **EFFECTS OF TRAINING CONTEXTUAL INTERPRETATION BIAS ON VULNERABILITY TO A MOOD CHALLENGE IN A DYSPHORIC SAMPLE: PART II**

A growing body of literature has emerged over the past seven years suggesting that interpretive bias training can be used to reduce anxious mood (e.g. Campbell, Rutherford & MacLeod, 2002; Mathews & Mackintosh, 2000; Wilson, MacLeod, Mathews, & Rutherford, 2006). The previous chapter investigated whether the principles of interpretive bias training could be applied to the despondent mood associated with depression. A new training task was developed to correct the overgeneralisation bias associated with depression, and it was investigated whether this training method could protect individuals exposed to triggers that would normally exacerbate a despondent mood. The effects of contextual training, which encouraged participants to see negative events as distinct and temporary, were compared to a control condition that did not frame the event as either contextual or general. As predicted, despondent mood was attenuated in the contextual group after recall of a negative autobiographical memory, a task which led to significantly worse mood in the control group. These results provide preliminary evidence that training tasks, which help individuals recognise cognitive biases in depression, can be developed to manipulate vulnerable thinking styles. The objective of the current study is to support and extend the findings of the previous study.

Several areas for modification were suggested in Chapter Six, some of which will be incorporated in to the present study. As suggested in the previous chapter, further investigations should aim to reduce despondent mood reported by the contextual group below base level, and monitor the time period over which any reduction in despondency lasts. Yiend et al. (2005) demonstrated the durability of training-congruent negative and positive biases to ambiguous passages. Yiend et al. introduced two delays: a 20 minute delay in-between the training and recognition tasks, and a 24 hour delay after the experiment was finished. Participants continued to show an interpretative bias congruent with training after both delays. However, unlike the changes in anxiety seen 20 minutes after the experiment, no changes in anxiety were seen on day two of testing.

The first goal of the present study was to reduce despondency in the contextual group below base level through the addition of two extra diary entries to the diary training task. The additional entries were included to attempt to strengthen effects of the training task on despondent mood. The durability of the training task on despondent mood was also investigated through the introduction of two delays. A 15 minute filler task was inserted after the writing task followed by a final set of mood scales. Mood was further monitored over the five days following the experiment via a continuation booklet that participants completed at home. Participants were asked to complete one set of mood scales each day, followed by a 'booster' diary task for four of the days, which follow the format of those on the day of the experiment. These additional entries were included to prompt contextual processing of negative events in the contextual group (participants in the control group continued to complete neutral entries). On the

final day participants completed a mood-reflection feedback form, which asked participants whether they had noticed any patterns in the diary entries and/or any changes in their mood over the past five days.

A further manipulation introduced for the present study concerned the writing task. In the previous study this task was completed by participants after the training task. Asking participants to recall a negative autobiographical memory was expected to act as a stressor which would elicit negative mood. This challenge was predicted to have less of an impact on despondency in participants in the contextual group, as the training task was designed to encourage participants to frame negative events within a contextual framework. Consistent with prediction, participants in the contextual group showed a decrease in despondency in response to this stress task, whereas the control group showed an increase in despondency. To investigate whether this difference was indeed due to the way in which participants responded to a negative stressor, and to examine whether a negative stressor task is a necessary component to elicit a decrease in despondent mood, a neutral writing task was introduced to the present study. Therefore, in addition to participants being allocated to either the contextual or control diary task conditions, within these groups, participants are allocated to either a negative or neutral writing task condition, resulting in four groups: a contextual-negative group (contextual diary entries, negative writing task); a control-negative group (neutral diary entries, negative writing task); a contextual-neutral group (contextual diary entries, neutral writing task); and a control-neutral group (control diary entries, neutral writing task). As in the previous study, the contextual and control

diary entries only differ in the words/phrases participants are exposed to in order to complete the entries.

A further area for expansion discussed in Chapter Six is the inclusion of an independent measure of contextual processing of negative events to support the proposed mechanism that changes in mood are due to changes in the activation of generalized representations. Although an important manipulation, the present study did not include such a measure for two reasons. Firstly, the researcher was very aware of the length of the experiment. The original study took participants approximately one hour to complete. Participant feedback from the previous study highlighted the intense concentration needed to complete the tasks, and many participants found the study tiring. With the addition of two extra diary entries and a 15 minute filler task, a further task would make the experiment too long. Secondly, as discussed in the scrambled-sentences studies reported in Chapters Three, Four and Five, a reliable, accurate and easy to complete measure of contextual representations is yet to be developed. Therefore, this study did not include such a measure.

Consistent with dual representation theory (DRT; Brewin, 1989, 1996), severity of despondent mood is predicted to be dependent on the number of negative generalised representations activated in memory. The contextual diary entries are designed to encourage participants to consider negative events within the context of other events over their lives, thereby limiting activation of generalised memory representations, and hence limiting the effect of such representations on mood. Therefore, as found in Chapter Six, an interaction between group and despondency is predicted for the



contextual negative and control negative groups, with a reduction in despondency in the contextual-negative group after the negative writing task, and an increase in despondency in the control-negative group. It is also predicted that the contextual-negative group will remain significantly less despondent than the control-negative group after the filler task.

Conversely, if as suggested in Chapter Six, the training task exerts its effects on mood by encouraging participants to apply contextual information to subsequently recalled negative events, a difference in despondent mood between the contextual- and control-neutral groups will not be expected. As found in the previous study, the negative diary tasks will initially lead to an increase in despondency in both groups. The contextual interpretation bias trained in the contextual group will not be applicable to the neutral writing task. Therefore the second prediction is that there will be no difference in end despondency levels between the contextual-neutral and control-neutral groups after the neutral writing task.

During the days following the experiment it is felt that participants in both contextual groups (negative and neutral) will have the opportunity to apply the contextually-trained interpretation bias to events they are experiencing. Therefore, a main effect of group (contextual vs. control) is predicted, with participants in the contextual-negative and contextual-neutral groups reporting a lower level of despondency overall than the control-negative and control-neutral groups.

To summarise, the present study has four hypotheses:

1. That despondency after the negative writing task will be significantly lower in the contextual-negative group compared to the control-negative group.
2. That the contextual-negative group will remain significantly less despondent than the control-negative group after the filler task.
3. That there will be no difference in despondent mood between the contextual-neutral and control-neutral groups after the neutral writing task.
4. That participants in the contextual-negative and contextual-neutral groups will report a lower level of despondency than the control-negative and control-neutral groups over the five days following the experiment.

## 7.2 METHOD

### 7.21 *Participants*

Ninety volunteers reporting current symptoms of depression (as identified by the Beck Depression Inventory, BDI-IA; Beck & Steer, 1993) were recruited through UCL's online subject pool. Volunteers falling below the threshold for current depression (those who scored less than 10, as defined by Beck & Steer, 1993) took part in the study presented in Chapter Five. According to Beck and Steer, of the 90 participants, 33 fell in to the category of mildly depressed (scoring between 10 and 16), 40 of moderately depressed (scoring 17-29), and 17 of severely depressed (scoring  $\geq 30$ ). As no clinical measure of depression was administered, the sample was referred to as *currently-dysphoric*. Fifty-four participants were female and 36 male, aged between 18 and 61 years old (mean age = 23.35 years).

### 7.22 *Design*

A mixed design was employed for the study. Participants were randomly assigned to one of four groups: contextual-negative, control-negative, contextual-neutral, or control-neutral. Participants in the two contextual groups both completed the same contextual version of the diary training task, and participants in the two control groups completed the same neutral version of the diary training task. Participants in the two negative groups completed the negative version of the writing task, and participants in the two neutral groups completed the neutral version of the writing task. The versions of the diary training task and writing task participants completed acted as the independent variable. The dependent variables were the despondent mood ratings.

### 7.23 Materials

Several of the materials used in the present study are the same as those described in Chapter Six. Materials differing from those presented previously will be described in detail. For further details of the other materials, please see Chapter Six.

1. *The Beck Depression Inventory* (Appendix I): Due to copyright regulations the BDI-IA rather than the BDI-II (Beck et al., 1996a), which was used in study Six, was used in this study (please see section 5.23 for more details about the BDI-IA).
2. *Mood scales* (Appendix O): Participants' despondent, happy and anxious mood was monitored throughout the study via three visual analogue scales ranging from 0 ("I do not feel at all X") to 100 ("I feel extremely X").
3. *Diary task*: This task follows the same format as that described in Chapter Six (see Appendices M and N for examples), with the addition of two extra diary entries. The additional entries followed the layout of those in study Six. The order in which the entries were presented was counterbalanced to prevent order effects.
4. *Filler task*: A 15 minute filler task was introduced after the writing task. Participants were asked to work their way through a number of picture puzzles taken from an adult puzzle book. The puzzles included required no language or mathematical skills to make sure that all participants would be able to complete them. The puzzles included were spot-the-difference, mazes, and picture-matching (see Appendix P for puzzle examples). Participants were told that they were not expected to complete all the puzzles and that it did not matter how many of the puzzles they finished in the 15 minutes.

5. *Writing task:* The writing task for the contextual-negative and control-negative groups was the same as that presented in Chapter Six. The writing task for the contextual-neutral and control-neutral groups followed the same format as the negative writing task, but differed in content. Like the negative writing task, participants were asked to write for five minutes, but on a topic focusing on descriptions of objects rather than emotions. The topic chosen was a description of the house the person grew up in. The instructions were as follows:

*Please spend the next 5 minutes describing what the house you grew up in looked like. Describe what the outside of the house was like – e.g. how big it was, what the road was like, what colour the door was; and describe what the rooms in the house were like – how many were there, how they were decorated, what the furniture was like, what the views from the windows were like, etc.*

6. *Continuation booklet* (Appendix R): Participants took home a booklet to complete over the five days following the experiment. Participants completed one, clearly marked, section each day. For four days, this involved completing one set of mood scales (identical to those used in the experiment) followed by a diary entry task. Four new entries were created for the continuation booklet, which followed the same format as those in the experiment and were consistent with the participant's group (i.e. either contextual or control). The order of the diary entries was counterbalanced across booklets. On the last day, participants completed a final set of mood scales followed by a mood-reflection feedback form. This form asked participants about their mood over the past five days;

whether they had experienced anything particularly good or bad in the past five days; whether they noticed any patterns in the diary entries; and if they did notice any patterns, whether they thought these affected their mood. This form was included to provide extra information should any patterns in mood ratings between the groups be found.

It was stressed to participants that they should only complete one section each day, and not to look at each section before completing it. A stamped-addressed envelope was provided in which to return the booklets.

#### ***7.24 Procedure***

On arrival, participants were given an information sheet (Appendix E). Immediately after completion of the BDI-IA, participants were randomly allocated to one of the four groups. It was explained that the first part of the study would be completed at UCL and would take approximately one and a half hours, and that the second part of the study required participants to complete a continuation booklet at home over the following five days. After obtaining informed consent, participants completed the first set of mood scales, followed by six diary entries (in a random order). The second set of mood scales was completed, followed by a five minute writing task (either negative or neutral). After completion of a third set of mood scales, participants spent 15 minutes working through the picture puzzles before rating their mood for a final time.

On completion of the experiment, participants were given the continuation booklet and told how to complete it. Participants were provided with a stamped-addressed envelope

in which to return the booklet. On receipt of the booklet, participants were sent a debriefing sheet (Appendix H) and a cheque for £20 as a reward for participation. Contact details of the experimenter were provided and participants were invited to get in touch should they have any further questions.

### ***7.25 Ethical considerations***

As participants were currently-dysphoric, information about several organisations that gave help and advice about depression was provided on the debriefing sheet. Contact details for the experimenter and her supervisor were provided should participants want to get in touch at a later date. Participants who were identified as severely-depressed by the BDI-IA were asked whether they had people they could talk to about their feelings and encouraged to seek help from their GP. The study was granted ethical approval from the UCL Research Ethics Committee.

### 7.3 RESULTS

Data from each participant were recorded, coded and analysed using SPSS version 11.5.

#### 7.31 Descriptive statistics

Checks for differences on demographic variables were made to make sure that the groups were comparable. ANOVA tests were carried out on age and total BDI-IA score data, and Chi Square analysis on the proportion of males and females in each group (Table 7.1). The mean age, total BDI-1A scores, and numbers of males and females in each group are displayed in Table 7.1.

**Table 7.1:** Mean age and total BDI-1A score (standard deviation), gender distributions and tests of demographic differences across the groups: contextual-negative, control-negative, contextual-neutral, and control-neutral

	Group				$F/\chi^2$	df	$p$
	Contextual – negative (n = 23)	Control – negative (n = 23)	Contextual – neutral (n = 22)	Control – neutral (n = 22)			
<b>Age</b>	25.59 (10.40)	22.87 (3.66)	21.64 (4.41)	23.32 (4.42)	1.51	3, 86	.22
<b>BDI</b>	22.04 (9.92)	23.65 (10.97)	21.68 (8.12)	19.09 (7.26)	.94	3, 86	.42
<b>Male:Female</b>	10:13	11:12	9:13	6:16	2.20	3	.53



### 7.32 Despondent mood data

Despondent mood ratings recorded on the day of the experiment were analysed for outliers (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile). Six outliers were identified: five in the control-negative group (two at the beginning of the study, '*start*'; three after the writing task, '*post-write*'); and one in the contextual-negative group at the beginning of the study. Table 7.2 presents the mean despondency scores for each group after the outliers were removed, and the skewness and kurtosis scores. (*Post-diary* refers to scores recorded after the diary task, and *end* refer to scores at the end of the experiment).

The mean despondent mood scores show similar patterns in the contextual- and control-negative groups, and similar patterns in the contextual- and control-neutral groups. In the two negative groups, despondent mood increased post-diary and again post-write, then decreased at the end. In the two neutral groups, although there was an increase in despondency post-diary, despondency then decreased post-write and again at the end of the experiment.

**Table 7.2:** Mean (standard deviation) despondency, skewness and kurtosis scores by group: contextual-negative, control-negative contextual-neutral, and control-neutral

Group	Time	Despondent mood score (Std. Dev)	Skewness (Std. err.)	Kurtosis (Std. err.)
<b>Contextual- negative</b>	Start	41.04 (22.70)	-.15 (.48)	-.35 (.94)
	Post-diary	47.91 (26.90)	-.30 (.48)	-.45 (.94)
	Post-write	59.35 (27.27)	-.73 (.48)	-.05 (.94)
	End	38.91 (25.04)	-.33 (.48)	-1.35 (.94)
<b>Control- negative</b>	Start	45.87 (24.96)	-.55 (.48)	-.85 (.94)
	Post-diary	51.52 (25.43)	-.50 (.48)	-.32 (.94)
	Post-write	58.04 (23.84)	-.50 (.48)	-.64 (.94)
	End	45.24 (26.10)	-.53 (.50)	-1.03 (.97)
<b>Contextual- neutral</b>	Start	34.36 (25.72)	.14 (.49)	-1.78 (.95)
	Post-diary	49.23 (24.71)	-.17 (.49)	-1.4 (.95)
	Post-write	35.50 (19.94)	.07 (.49)	-.99 (.95)
	End	27.50 (23.03)	.70 (.51)	-.43 (.99)
<b>Control- neutral</b>	Start	35.36 (23.31)	-.01 (.49)	-1.21 (.95)
	Post-diary	43.45 (25.25)	-.24 (.49)	-1.07 (.95)
	Post-write	30.46 (23.90)	.42 (.49)	-1.12 (.95)
	End	27.68 (21.70)	.75 (.49)	.00 (.95)

### ***Hypothesis i***

*After recalling a negative event expected to decrease mood, the mood of participants in the contextual-negative group, forced to choose contextual words/phrases to complete the diary entries, will be less despondent than participants in the control-negative group.*

A repeated measures ANCOVA was conducted with group (contextual-negative, control-negative) as the between-subjects factor and time (despondency post-diary, post-write, end of experiment) as the within-subjects factor. Despondency at the start of the study was included as a covariate to eliminate any group differences at baseline. A significant main effect of time was found ( $F(2, 86) = 5.04, p > .05$ ). When collapsed across the groups, overall mean despondency scores were 49.72 post-diary, 58.70 post-write, and 42.08 at the end. Paired-samples  $t$  tests (Table 7.3) were carried out to identify where the differences lay. After a Bonferroni correction to control for type I errors (mistakenly identifying a non-significant result as significant), significant differences in despondency were found post-diary compared to post-write task; post-diary compared to end; and post-write compared to end. Therefore, after an initial significant increase in despondency post-write, there was a significant decrease in despondency at the end of the study. The end despondency rating is similar to the covariate despondency level at the start of the study (covariate mean = 43.50), suggesting despondency levels returned to base level.

**Table 7.3:** Comparison of despondent mood ratings post-diary, post-write and at the end of the study collapsed across the contextual-negative and control-negative groups

Comparison	$t$ ( $df = 45$ )
Post-diary vs. post-write	-3.69*
Post-diary vs. end	2.66*
Post-write vs. end	5.37*

\*  $p < .017$

There was no significant main effect of group ( $F(1, 44) = .10, p > .05$ ), and no significant interaction between group and time ( $F(2, 86) = .80, p > .05$ ). Therefore the hypothesis was not supported. (N.B. Including gender as a covariate in the analysis did not affect the results).

***Hypothesis ii:** Despondent mood after the filler task will be lower in the contextual-negative group than in the control-negative group.*

As can be seen from the repeated measures ANCOVA discussed for hypothesis i, a significant interaction was not found between group and time, therefore this hypothesis was not supported.

***Hypothesis iii:** After writing about a neutral topic, not expected to utilise the contextual training from the diary task, despondent mood will not differ between the contextual-neutral and control-neutral groups.*

An identical repeated measures ANCOVA to that carried out on the negative-writing task groups was conducted on the data collected from the neutral writing task groups. Group (contextual-neutral, control-neutral) was the between-subjects factor and time (post-diary, post-write, end) was the within-subjects factor, with despondency at the start of the study included as a covariate to eliminate any group differences at baseline. A significant main effect of time was found ( $F(2, 86) = 5.07, p < .01$ ). Mean despondency scores across the two groups were 45.79 post-diary, 32.28 post-write, and 27.62 at the end. Paired-samples  $t$  tests (Table 7.4) showed that, after a Bonferroni correction, there was a significant difference between despondency post-diary compared to post-write; post-diary compared to the end; but not post-write compared

to the end of the experiment. Therefore despondency significantly decreased after the writing task and again at the end of the study, although not significantly. The mean covariate start-despondency score was 34.45, indicating a lower despondency level at the end of the study than that at the start.

**Table 7.4:** Comparison of despondent mood ratings post-diary, post-write and at the end of the study collapsed across the contextual-neutral and control-neutral groups

Comparison	<i>t</i> ( <i>df</i> = 45)
Post-diary vs. post-write	4.84*
Post-diary vs. end	6.41*
Post-write vs. end	2.44

\*  $p < .017$

There was no significant main effect of group ( $F(1, 42) = 1.20, p > .05$ ), and no significant interaction between group and time ( $F(2, 86) = .50, p > .05$ ). Although these results do support the hypothesis, it should be noted that as a null hypothesis was formulated, results should be regarded with care. When predicting “no effect”, a non-significant result could just be due to the small sample size. Therefore, although the data support the hypothesis in relation to the sample used, it cannot be said that the data suggest that there would be no difference in post-write scores in the depressed population as a whole.

### **7.33 Continuation booklet data**

Eighty-five of the ninety continuation booklets were returned. Out of the booklets that were not returned, two were from the contextual-negative group and one was from each of the other groups. The data were collapsed across the contextual-negative and contextual-neutral groups, and across the control-negative and control-neutral groups, forming two groups: a contextual group and a control group. To make sure that the contextual-negative and contextual-neutral groups, and the control-negative and control-neutral groups were similar, two repeated measures ANOVAs were conducted with group (negative, neutral) as the between-subjects factor and day (1, 2, 3, 4, 5) as the within-subjects factor. No significant main effects of time or group, and no interactions between time and group were found between the two contextual or between the two control groups (largest  $F_{(1, 39)} = 3.60, p > .05$ ). This suggests that the groups were similar enough to justify collapsing the data across the two contextual groups and the two control groups. Outlier checks were performed on the data, but no outliers were identified. Table 7.5 presents the mean despondent mood scores collected from the continuation booklets for the contextual and control groups. Skewness and kurtosis scores are also presented. The mean scores do not show any clear patterns in the data. There is a trend for the control group to give lower despondency ratings than the contextual group, except on day five where ratings are similar.

**Table 7.5:** Mean despondency, skewness and kurtosis follow-up scores for the contextual and control groups

Group	Continuation booklet day	Despondent mood score (Std. Dev)	Skewness (Std. err.)	Kurtosis (Std. err.)
<b>Contextual</b>	One	40.71 (25.24)	.03 (.37)	-.99 (.72)
	Two	42.86 (24.42)	.33 (.37)	-.46 (.72)
	Three	34.88 (26.12)	.46 (.37)	-.38 (.72)
	Four	39.26 (24.99)	.31 (.37)	-.66 (.72)
	Five	35.90 (25.67)	.72 (.37)	.15 (.72)
<b>Control</b>	One	35.88 (28.26)	.16 (.36)	-1.32 (.71)
	Two	33.93 (23.01)	.13 (.36)	-1.15 (.71)
	Three	31.36 (26.56)	.24 (.37)	-1.11 (.72)
	Four	32.93 (26.38)	.16 (.37)	-1.55 (.72)
	Five	36.27 (26.69)	-.12 (.37)	-1.16 (.72)

#### ***Hypothesis iv***

*Over the days following the experiment, it is predicted that both contextual groups will show lower levels of despondency than both control groups, hence a main effect of group (contextual vs. control) is expected.*

A repeated measures ANOVA was carried out on the data with day (1, 2, 3, 4, 5) as the within-subjects factor and group (contextual, control) as the between-subjects factor. There were no significant main effects (time:  $F(1, 83) = .93, p > .05$ ; group  $F(1, 83) = 1.93, p > .05$ ), and no significant interaction ( $F(1, 83) = 1.07, p > .05$ ). The data did not support the hypothesis. Similarly including post-write despondency and gender as covariates did not yield any significant main effects or interactions (largest  $F(1, 83) = 3.08, p > .05$ ).

### ***7.34 Additional analyses***

Happy and anxious mood data were also analysed. Although only included as foils to disguise the focus on despondent mood scores, identical analyses were carried out on this data for completeness.

#### ***Happy mood data***

Checks for outliers (defined as scores more than three inter-quartile ranges above the upper quartile or below the lower quartile) were carried out on the happy mood data collected on the day of the experiment. Six outliers were identified: five in the control-negative group (one at the start, two post-diary, two post-writing); and one in the contextual-negative group post-diary. These were converted to one point above or below the next highest or lowest score. The means after conversion of outliers, skewness, and kurtosis for each group are displayed in Table 7.6.

Mean happy mood scores show the opposite patterns (as would be expected) to the despondency scores. In the contextual- and control-negative groups, happiness decreased post- diary and post-write, and then increased at the end of the study. In the contextual- and control-neutral groups, happiness initially decreased after the diary task, then increased after the writing task and at the end of the study.



**Table 7.6:** Mean (standard deviation) happiness, skewness and kurtosis scores by group: contextual-negative, control-negative, contextual-neutral, control-neutral

<b>Group</b>	<b>Time</b>	<b>Happy mood score (Std. Dev)</b>	<b>Skewness (Std. err.)</b>	<b>Kurtosis (Std. err.)</b>
<b>Contextual- negative</b>	Start	37.43 (24.00)	.61 (.48)	.51 (94)
	Post-diary	26.00 (25.16)	1.16 (.48)	1.23 (94)
	Post-write	23.91 (25.94)	1.07 (.48)	.48 (94)
	End	30.87 (25.57)	.91 (.48)	.71 (94)
<b>Control- negative</b>	Start	34.13 (23.43)	1.24 (.48)	1.53 (94)
	Post-diary	28.22 (23.00)	1.08 (.48)	1.28 (94)
	Post-write	19.30 (22.41)	2.00 (.48)	4.27 (94)
	End	32.86 (24.52)	.85 (.50)	-.48 (97)
<b>Contextual- neutral</b>	Start	34.41 (19.32)	-.25 (.49)	-.73 (.95)
	Post-diary	24.41 (19.31)	.52 (.49)	-.99 (.95)
	Post-write	38.73 (23.94)	.06 (.49)	-1.29 (.95)
	End	40.00 (22.65)	-.59 (.51)	-.72 (.99)
<b>Control- neutral</b>	Start	35.82 (20.92)	.57 (.49)	-.06 (.95)
	Post-diary	27.05 (19.13)	.52 (.49)	-.65 (.95)
	Post-write	38.32 (20.22)	.15 (.49)	-.84 (.95)
	End	42.05 (22.07)	.30 (.49)	-.89 (.95)

Outlier checks were also carried out on the continuation booklet happy mood data. Three outliers were identified: two happy mood scores in the control group (one on day five and one on day six), and one happy mood score on day six in the contextual group. Table 7.7 presents the means after conversion of outliers, skewness and kurtosis scores for the happy mood data over the five days following the experiment.

**Table 7.7:** Mean group happiness, skewness and kurtosis follow-up scores by group:  
contextual-negative, control-negative, contextual-neutral, control-neutral

Group	Continuation booklet day	Happy mood	Skewness	Kurtosis
		score (Std. Dev)	(Std. err.)	(Std. err.)
<b>Contextual</b>	One	35.93 (20.44)	.46 (.37)	.34 (.72)
	Two	32.62 (23.46)	.54 (.37)	.41 (.72)
	Three	39.88 (23.28)	.39 (.37)	.31 (.72)
	Four	32.26 (21.31)	.30 (.37)	-.02 (.72)
	Five	39.46 (21.16)	.05 (.37)	.35 (.72)
<b>Control</b>	One	35.93 (26.15)	.34 (.36)	-.65 (.71)
	Two	37.65 (23.86)	.41 (.36)	-.62 (.71)
	Three	36.62 (24.82)	.31 (.37)	-.72 (.72)
	Four	38.05 (22.68)	-.02 (.37)	-.78 (.72)
	Five	36.29 (23.96)	.35 (.37)	-.30 (.72)

From looking at the mean scores, there are no clear patterns in the happy mood data. As the analyses followed those for the despondent mood data, the happy mood analyses on the data collected on the day of the experiment and on data from the continuation booklet are summarised in Table 7.8.

**Table 7.8:** Analysis of happy mood data collected on the day of the experiment and in the continuation booklets

Statistical test	Between-subjects factor	Within-subjects factor	Comparison (df)	<i>F</i>
Repeated measures ANCOVA (covariate = start happy)	Group: contextual-negative vs. control-negative	Time: happiness post-diary/post-writing/end	Main effect of time (2, 82) Main effect of group (1, 41) Time x group interaction (2, 82)	3.19* .02 2.42
Repeated measures ANCOVA (covariate = start happy)	Group: contextual-neutral vs. control-neutral	Time: happiness post-diary/post-writing/end	Main effect of time (2, 78) Main effect of group (1, 39) Time x group interaction (2, 78)	5.29** .00 .68
Repeated measures ANOVA	Group: contextual vs. control	Time: follow-up happiness day 1/2/3/4/5	Main effect of time (4, 76) Main effect of group (1, 79) Time x group interaction (4, 76)	.69 .50 1.87

\* $p < .05$ ; \*\* $p < .01$

Significant main effects of time were found for both the negative writing task groups and the neutral writing task groups. Table 7.9 displays the paired samples *t* tests carried out to investigate the significant main effects. Paired *t* tests were carried out across the contextual-negative and control-negative groups, and across the contextual-neutral and control-neutral groups. A Bonferroni correction was applied to control for type I errors.

**Table 7.9:** Post-hoc paired sample *t* tests on negative and neutral groups' happiness data

<b>Groups</b>	<b>Comparison</b>	<b><i>T</i></b>	<b>Df</b>
Contextual-negative and control-negative	Post-diary task vs. Post-writing task	2.85*	45
	Post-diary task vs. End of study	-2.53*	43
	Post-writing task vs. End of study	-4.11*	43
Contextual-neutral and control-neutral	Post-diary task vs. Post-writing task	-5.62*	43
	Post-diary task vs. End of study	-5.69*	41
	Post-writing task vs. End of study	-.66	41

\* $p < .017$ ;

The post-hoc analyses suggest that all the *t* tests were significant, except for that between post-writing and end for the neutral groups. Interpretation of these results through inspection of the means suggests that, for the negative groups, happiness decreased significantly from post-diary (mean = 25.11) to post-writing (mean = 19.80), then increased post-writing to end (mean = 31.92). End happiness was also significantly higher than post-diary happiness. For the neutral groups, happiness increased post-diary (mean = 26.43) to post-writing (39.69). End happiness (mean = 41.03) was greater than post-diary, but not than post-writing happiness. (N.B. including gender as a covariate in the repeated measures ANCOVAs did not affect the results).

#### ***Anxious mood data***

As for the despondent and happy mood data, outlier checks were carried out on the anxious mood data collected on the day of the experiment and the data collected in the continuation booklets. Two post-diary outliers were found in the data collected on the

day of the experiment in the control-negative group. These were converted using the same method as for the despondent and happy mood data. No outliers were found in the continuation book data. Table 7.10 presents the means after conversion of outliers, skewness and kurtosis scores for each group on the day of the experiment.

**Table 7.10:** Mean (standard deviation) anxiety, skewness and kurtosis scores by group: contextual-negative, control-negative, contextual-neutral, control-neutral

Group	Time	Anxious mood	Skewness (Std. err.)	Kurtosis (Std. err.)
		score (Std. Dev)		
Contextual-negative	Start	43.70 (27.06)	-.25 (.48)	-1.25 (.94)
	Post-diary task	41.26 (31.43)	.31 (.48)	-1.36 (.94)
	Post-writing task	37.65 (29.83)	.11 (.48)	-1.38 (.94)
	End	36.61 (34.06)	.41 (.48)	-1.28 (.94)
Control-negative	Start	52.83 (27.21)	-.28 (.48)	-.21 (.94)
	Post-diary task	53.04 (27.83)	-.35 (.48)	-.23 (.94)
	Post-writing task	54.00 (29.77)	-.44 (.48)	-.79 (.94)
	End	46.67 (30.67)	-.25 (.50)	-.97 (.97)
Contextual-neutral	Start	43.27 (25.69)	-.20 (.49)	-.87 (.95)
	Post-diary task	45.41 (24.42)	.03 (.49)	-.91 (.95)
	Post-writing task	36.05 (23.88)	.32 (.49)	-1.13 (.95)
	End	36.25 (21.88)	.69 (.51)	-.54 (.99)
Control-neutral	Start	46.14 (30.51)	.07 (.49)	-1.28 (.95)
	Post-diary task	50.45 (28.57)	-.32 (.49)	-.86 (.95)
	Post-writing task	36.14 (27.16)	-.07 (.49)	-1.37 (.95)
	End	36.36 (29.16)	.27 (.49)	-1.30 (.95)

There is less fluctuation in mean anxious mood scores. In the contextual-negative, control-negative and contextual-neutral groups there is little change in anxiety between

the start and post-diary task anxious scores. The control-neutral group shows a small increase in post-diary task anxiety. The contextual-negative, contextual-neutral and control-neutral groups all show a decrease in anxiety post-writing task, and then little difference between post-writing anxiety and end anxiety. The control-negative group however show little change between post-diary and post-writing anxiety, and then a decrease in anxiety at the end of the study.

Table 7.11 presents the means, skewness and kurtosis scores collapsed across the contextual-negative and contextual-neutral groups (*contextual group*), and across the control-negative and control-neutral groups (*control groups*) for the anxious mood data collected during the five days following the experiment.

**Table 7.11:** Mean group anxiety, skewness and kurtosis follow-up scores for the contextual and control groups

Group	Continuation booklet day	Anxious mood		
		score (Std. Dev)	Skewness (Std. err.)	Kurtosis (Std. err.)
<b>Contextual</b>	One	37.37 (24.80)	.42 (.37)	-.64 (.72)
	Two	36.98 (25.62)	.50 (.37)	-.79 (.72)
	Three	42.12 (23.56)	.05 (.37)	-.67 (.72)
	Four	40.50 (26.72)	.12 (.37)	-1.3 (.72)
	Five	40.32 (23.46)	-.13 (.37)	-.87 (.72)
<b>Control</b>	One	39.88 (25.27)	-.13 (.36)	-.71 (.71)
	Two	39.47 (27.18)	.45 (.36)	-.91 (.71)
	Three	34.14 (24.75)	.24 (.37)	-1.42 (.72)
	Four	42.38 (24.46)	-.15 (.37)	-.94 (.72)
	Five	36.46 (26.18)	.11 (.37)	-1.33 (.72)

Table 7.11 does not present any clear patterns in the anxious mood data. Analyses carried out on the data collected on the day of the experiment and from the continuation booklet are summarised in Table 7.12. As can be seen, no significant main effects or interactions were found. These results were not affected when gender was included as a covariate in the analyses.

**Table 7.12:** Analysis of the anxious mood data collected on the day of the experiment and in the continuation booklet

Statistical test	Between-subjects factor	Within-subject factor	Comparison (df)	<i>F</i>
Repeated measures ANCOVA (covariate = start anxious)	Group: contextual-negative vs. control-negative	Time: anxiety post-diary/post-writing/end	Main effect of time (2, 82) Main effect of group (1, 41) Time x group interaction (2, 82)	.76 .66 1.30
Repeated measures ANCOVA (covariate = start anxious)	Group: contextual-neutral vs. control-neutral	Time: anxiety post-diary/post-writing/end	Main effect of time (2, 78) Main effect of group (1, 39) Time x group interaction (2, 78)	2.03 .00 .36
Repeated measures ANOVA	Group: contextual vs. control	Time: follow-up anxiety day 1/2/3/4/5	Main effect of time (4, 76) Main effect of group (1, 79) Time x group interaction (4, 76)	.41 .14 1.58

## 7.4 DISCUSSION

It was predicted that after the writing task, participants in the contextual-negative group would show a greater reduction in despondency than the control-negative group. Conversely, a significant difference was not predicted in despondency ratings after the writing task between the contextual-neutral and control-neutral groups. Two group by time repeated measures ANCOVAs were carried out, one on the negative writing task groups and one on the neutral writing task groups. Neither ANCOVA yielded a significant interaction between group and time. This does not support the hypothesis for the negative-writing task groups, but does support the hypothesis for the neutral writing task groups. The lack of a significant interaction between contextual-/control-negative groups and time also does not support the hypothesis that despondent mood after the filler task will be lower in the contextual-negative group than in the control-negative group. The fourth hypothesis predicted that, when data was collapsed across the two contextual groups and across the two control groups, both the contextual groups would show lower levels of despondency than both control groups over the five days following the experiment. This hypothesis was not supported by a group by time repeated measures ANOVA.

Although no significant interactions were found, significant main effects of time were found across the two negative writing task groups, and across the two neutral writing task groups. Post-hoc analyses suggested that when despondency data were collapsed across the contextual-negative and control-negative groups, despondency was found to increase from after the diary task to after the writing task, then decrease at the end of



the study to a level below that after the diary task. End-despondency was at a similar level to that at the start of the study. Investigation of the mean despondency scores across the contextual-neutral and control-neutral groups showed a different pattern. Despondency decreased after the writing task and then further after the filler task, with end-despondency being lower than base level.

The despondent mood analyses findings were mirrored in the identical analyses of the happy mood data. No significant interactions or significant main effects of group were found, however significant main effects of time were found. Post-hoc analyses of the main effect of time across the contextual-negative and contextual-neutral groups suggested that happiness decreased after the writing task then increased at the end of the study to a level slightly below that at the start of the study. Analysis of the happiness data across the contextual-neutral and control-neutral groups showed increased happiness, resulting in an end happiness score higher than at the start. As would be expected, these results were the opposite from those for despondent mood. No significant main effects or interactions were found for the anxious mood data.

Therefore, as predicted, the contextual-neutral and control-neutral groups did not differ in levels of post-writing task despondency. The main effect of time suggested that the neutral-writing task actually decreased despondency in both groups (contextual- and control-neutral). It is possible that writing about the house participants grew-up in triggered some happy memories from the past, which would account for the increase in happy mood after the writing task.

However, the present study failed to replicate the results presented in Chapter Six. On reflection, it is possible that too many changes were made in the present study. Addition of two extra diary entries may have resulted in the presentation of too much negative material. When combined with a negative writing task, this may have been too much for the dysphoric participants, overriding any learning from the diary task. Some of the feedback gained from participants about the diary task in the continuation booklet illustrated this, for example: *“some diaries were examples of things I have experienced, so I was forced to remember not so pleasant times, which lowered my mood.”*; *“the sad themes affected my mood as I thought ‘what if I end up like that.’”*; *“when the situations in the passages related to myself, they could make me feel useless and down.”*.

Another possibility is that the diary task was too long, requiring too much focused attention. Participants may have got bored when completing the last couple of entries and not properly processed the contextual material and simply read the entries as negative events. Again, some of the feedback in the continuation booklets reflected this, for example: *“I thought more about the meanings of the entries at the beginning and later just filled-in the blanks as a drill exercise.”*; *“I found the situations most similar to my own the hardest to read - when counting the syllables I found my mind wandering & worrying.”*; *“the only thing that bothered me was counting the number of two-syllable words. When the diary author was really sad it just got on my nerves”*.

Conversely, many participants commented on the cathartic nature of the diary entries. For example: *“After a while the entries were helpful as they reassured me that*

*someone else could also relate to how I felt. This made me not feel so alone.”; “Certain entries had particular relevance to me. Reading them and seeing someone reflect their own feelings made me realise that I’m not alone in this feeling of isolation.”; “The entries made me think about my own feelings and mood, and made me slightly more optimistic.”; “The entries probably made me think and look at things more favourably rather than focusing on negative events. This probably helped improve my mood as it let me think of positives in situations”.* This feedback suggests that diary tasks such as these have the potential to help patients reflect on their problems, and to help them see that what they are feeling is normal and that they are not alone.

Future research should investigate the use of such diary entries, testing the optimum number of entries to use. Confounds such as concentration span, boredom and fatigue should be considered when designing studies where focused attention is essential for the training bias to have an effect. Maintaining the attention of depressed participants can be particularly difficult, as attention and working memory deficits are characteristic of depression. For example, the Resource Allocation Model (RAM; Ellis & Ashbrook, 1988; Ellis & Moore, 1999) suggests that performance on effortful or resource-dependent tasks is reduced by affective states limiting available processing resources available. Nolen-Hoeksema (1991) suggests that the difficulty depressed patients can have solving problems may be impaired through interference by negative cognitions made accessible through rumination. Similarly, Kuyken and Brewin (1995) suggested that overgeneral memory problems seen in the depressed may be secondary to reductions in working memory brought about by attempts to avoid intrusive autobiographical memories.

A further area for future research on interpretive training techniques for the depressed, is the development of a measure of contextual thinking. Previous interpretive bias-training paradigms (e.g. Mathews & Mackintosh, 2000; Yiend, Mackintosh, & Mathews, 2005) have successfully shown transference of the training-bias to new material. The training phase in these studies required participants to read short descriptions of ambiguous social scenarios. Participants completed a word fragment at the end of each scenario that revealed its meaning. The word fragment was either positive or negative, depending on the training condition. In a second phase, participants were exposed to new social situations and word fragment completion, but this time the completed word maintained the ambiguity of the situation. Transference of training was tested through interpretation of the new situations via a recognition task. Participants rated the similarity of four sentences related to each ambiguous situation. Two sentences were closely matched disambiguated 'targets' to the content of the passage, but which gave the passage a positive versus negative meaning. The other two sentences were positive and negative foils. Participants who rated training-congruent target sentences as most similar to the passage were suggested to be showing an interpretive bias. Rating valence-congruent foils as more similar than the valence-incongruent foils was said to indicate generality to new training-congruent material.

This paradigm could be adapted to test transference of contextual interpretations from the diary training task. During the test phase, participants could be presented with a new diary entry where all participants complete the gaps with neutral words/phrases.

Participants could then be presented with contextual and general statements relevant to the new diary entry and asked to rate which are and are not similar to the diary entry.

In conclusion, attempts to replicate the findings in Chapter Six were not successful. Participants who completed the diary entries with contextual words/phrases did not show a significantly lower level of despondency after the negative writing task than participants who completed neutral versions of the diary entries. As hypothesized, participants in the contextual-neutral and control-neutral groups also did not differ in despondency levels after the neutral writing task. Similarly, there were no differences in despondency between the contextual and control groups over the five days following the experiment. Feedback from participants suggests that the experiment may have been too long and required too much focused attention, confounding any possible changes in despondency. Feedback also suggested that some participants did find the diary task cathartic, supporting further development of such training tasks.

## **CHAPTER 8**

### **DISCUSSION**

#### ***8.1 Outline***

The empirical chapters of this thesis set out to fulfil three main objectives: firstly, to investigate whether overgenerality to positive and negative cue words is a function of the autobiographical memory test (AMT) itself, rather than an accurate representation of memory recall in depression. The second objective was to explore the mechanism proposed in Brewin's dual representation theory (DRT, 1989). A scrambled sentences paradigm was used to investigate whether reducing access to generalised negative situationally accessible memories (SAMs), by encouraging participants to consider their mood within a broader context, could reduce the effects of negative primes on despondent mood. Thirdly, building on the previous objective of using contextual information to reduce despondency, a training paradigm was developed to assess whether currently-dysphoric participants' despondent mood could be successfully reduced by inducing a contextual interpretive bias. This chapter will summarise each of these objectives and how they were tackled in turn, and consider whether the aims were met. The limitations of the research presented in this thesis will then be discussed, both in relation to the measures specifically designed for the research presented in this thesis, and in relation to the more established measures used. The relationship of the research carried out to current literature and the implications of the findings are considered. The concluding section of this chapter will present suggestions for future research.

## **8.2 Addressing the thesis objectives**

### *8.21 Generality in the thoughts and memories of the currently-dysphoric, formerly-depressed, and never-depressed*

The aim of the study presented in Chapter Two was to investigate a discrepancy between cognitive theories of depression and findings from AMT studies: where as AMT findings suggest that overgeneral memory (OGM) representations in the depressed are negative *and* positive, cognitive theories imply they are just negative. To investigate this discrepancy, an alternative measure of memory specificity to the AMT was required that allowed for more naturalistic recall of thoughts and memories. As an alternative standardised measure of OGM has not yet been established, a coding frame was developed, which was used to code students' essays.

Compared to the AMT, the essay writing task, which simply asked participants to write continuously for 20 minutes about their thoughts and feelings of being in college, is felt to be a more naturalistic task. The task enables participants to think more freely about something that happened to them in their relatively recent past, with out having to jump from one memory to another according to a series of presented cue words. Unlike the AMT, the essay task does not impose any time constraints. The artificiality of being forced to respond to cue words, some of which may not be relevant to the individual is removed, and the task instructions remain in front of participants, reducing the load imposed on working memory. The essays also allow for more detailed analysis of the recalled material. Rather than classifying one memory as either specific or overgeneral overall as in the AMT, essays were broken-down in to

utterances, and each utterance coded as contextual or general, and as either positive or negative in valence.

Essays from one hundred and twenty three currently-dysphoric, never-depressed, and formerly-depressed students were analysed. The findings indicate that currently-dysphoric students produced significantly more negative general thoughts and memories, and significantly fewer positive general thoughts and memories, than never- and formerly-depressed students. This is in contrast to AMT findings and so suggests that overgeneral responses on the AMT do not necessarily imply the presence of corresponding generalized representations in memory. Thus the study was successful in investigating the discrepancy between cognitive theories of depression and AMT study findings.

#### *8.22 Effects of contextual questions on experimentally-induced despondency*

Chapters Three, Four and Five investigated whether, as suggested in Brewin's (1989) DRT, the effects of negative mood primes on experimentally-induced despondent mood could be reduced by encouraging participants to consider their mood within the context of moods changing over time and events. Successful reduction of despondency was suggested to be due to the reduced accessibility of negative SAMs, which would normally be triggered by the negative primes, thereby supporting DRT. The first aim was to replicate Watkins, Teasdale and Williams' (2003) study, which used a scramble-sentences task (SST). This paradigm was employed in the studies described in Chapters Three, Four and Five. The second aim of these studies was to provide evidence of changes in participants' cognitive representations. If, as suggested in DRT,



activation of generalised SAMs is reduced and contextualised VAMs (verbally accessible memories) are instead activated, this should be reflected by the production of more contextualised cognitive representations. As no established measure of cognitive representations exists, attempts to develop a new measure were made in these studies.

To meet these aims, two key changes to Watkins et al.'s (2003) study were made: Firstly, in addition to the unstable-contextual questions developed by Watkins et al., a second set of specific-contextual questions, which increased awareness of mood changing over events, was introduced in Chapter Three. Secondly, Watkins et al. did not include a measure of participants' thoughts to check whether the contextual questions were successful in limiting the activation of negative SAMs. Therefore, changes in cognitive representations were investigated using a stream of consciousness task.

The findings presented in Chapter Three were consistent with those of Watkins et al. (2003). Compared to participants who unscrambled the control questions, participants who unscrambled the unstable-contextual questions showed a significantly greater reduction in despondent mood after the SST. Participants who unscrambled the newly-developed specific-contextual questions did not show a significant reduction in despondency, which was suggested to be due to these questions being harder to unscramble than the unstable-contextual questions. As such, the specific-contextual questions were modified for the other SST studies (Chapters Four and Five) to eliminate this confound. Despite modifying the specific-contextual questions, a

significantly lower despondent mood after the SST was not found in either Chapter Four or Five. Similarly, despondent mood was not found to be significantly lower in participants who unscrambled the unstable-contextual questions. However the unstable-contextual group's post-SST despondency reported in Chapter Five was considerably lower than the specific-contextual and control groups'. This was reflected in the analysis between the groups' post-SST despondency, which had a significance level just above the 0.05 alpha level ( $p = .059$ ).

Although two further attempts were made to develop a more reliable and accurate task to measure contextual versus generalised cognitive representations, differences between the contextual and control groups were not found. Thus, in relation to the aims of the studies, findings were mixed. Chapter Three successfully fulfilled the aim of replicating Watkins et al.'s (2003) findings, supporting the mechanism proposed in DRT. However, extension of these findings through inclusion of a second set of specific-contextual questions was not successful, nor was an accurate measure of participants' cognitive representations successfully developed. Potential limitations of the studies presented in Chapters Three, Four and Five are discussed in more detail later in this chapter (section 8.3).

### *8.23 Effects of training contextual thinking on vulnerability to a mood challenge in a dysphoric sample*

Chapters Six and Seven investigate the use of a new form of training designed to manipulate the overgeneralisation bias associated with depression. These chapters aimed to build on existing training literature by developing a task that could be used to

reduce despondency in currently-dysphoric participants. In line with the literature discussed in Chapter Three, the use of contextual information, which should reduce the activation of negative SAMs, to reduced despondent mood was applied to the training task.

A diary training task was developed, which encouraged currently-dysphoric participants to see negative events as distinct and temporary, by forcing them to put these events in context. As predicted, the findings presented in Chapter Six indicated that after describing a negative autobiographical memory, despondent mood was attenuated in the contextual but not the control group. These findings are both consistent with DRT, and add to the literature on training biases, suggesting that it is possible to manipulate cognitive biases which then affect mood.

Chapter Seven built on Chapter Six, with the objective of supporting and extending the findings. Further aims of Chapter Seven were to reduce despondency at the end of the study in the contextual group below base level, and to monitor mood over the five days following the experiment to see whether any differences in mood between the control and contextual groups remained. Analysis of mood scores between the contextual and control groups showed no significant differences either during the experiment or over the five days following the experiment. Thus the results presented in Chapter Seven did not support those of Chapter Six; however, as discussed in more detail later in this chapter (section 8.3), the lack of support may have been due to too many changes to the original paradigm. As such, Chapters Six and Seven were successful in building on

the interpretive training literature by developing a new task with the potential, after further development, to be utilised in future research.

### **8.3 Limitations**

This section of the chapter is broken down in to five subsections: sample limitations; limitations of the contextual manipulation tasks; limitations concerning measurement of cognitive representations; mood induction procedure limitations; and mood scale limitations. Each section will discuss the limitations identified from the research carried-out and give suggestions for improvements should the measures be used again.

#### *8.31 Sample limitations*

The majority of participants who took part in the studies were university students. Although advantageous as students are relatively easy to recruit, the generalisability of the findings to the general population is reduced. Conversely, due to the diversity of students at UCL, volunteers were of many nationalities, from a number of academic backgrounds and disciplines, and a range of ages.

A second limitation relates to the studies presented in Chapters Two, Six and Seven, all of which used currently-dysphoric participants. As the research investigated overgenerality in depression, ideally currently-depressed participants would have been recruited. Although participants identified as currently-dysphoric were all identified as depressed by the Beck Depression Inventory (Beck & Steer, 1993; Beck et al., 1996a), clinical interviews were not conducted on these participants to establish whether they were clinically depressed. However, the Beck Depression Inventory has been found to

be a valid measure of the severity of depression symptoms in student samples (Whisman, Perez, & Ramel, 2000). Furthermore, an analysis conducted in Chapter Six between participants scoring above and below 21 on the BDI-II indicated that the effects of the contextual diary entries on mood were not restricted to those with mild levels of dysphoria. As such, the thoughts and feelings that the currently-dysphoric participants would have been experiencing are likely to have been similar to those experienced by clinically depressed patients. However, to eliminate this possible limitation and to add to the clinical significance of the results, future research should aim to recruit clinically depressed patients.

### *8.32 Limitations of the contextual manipulation tasks*

The studies in Chapters Three through to Seven investigated the effects of a SST and a diary task on despondent mood. Both tasks were designed to encourage participants to consider their mood in the context of it changing over time and events. Although the SST had previously been shown to significantly reduce despondency (Watkins et al., 2003), successful replication of Watkins et al.'s finding using the unstable-contextual and control versions of the SST was only achieved in Chapter Three. Despite amendments to the newly-developed specific-contextual questions in Chapter Four, a significant reduction in despondency after the SST was not achieved in any of the studies. As the unstable-specific contextual questions also did not significantly reduce despondency in Chapters Four and Five, it is difficult to conclude whether the specific-contextual questions did not reduce despondency because of the questions themselves, or due to confounding factors.

Failure of the experiments to support previous results suggests that the SST may be particularly sensitive to confounding factors. This was illustrated in Chapter Four, which used a different mood induction procedure. The film mood induction procedure was subsequently thought to induce an externally-focused rather than internally-focused sad mood, which may have been the reason why the contextual versions of the SST were unsuccessful in reducing despondency.

Similar inconsistencies in results are reported in the diary task studies (Chapters Six and Seven). The findings from Chapter Six showed a significant reduction in despondency in the contextual but not the control group. However, this result was not replicated in Chapter Seven. Several modifications were made to the paradigm used in this second diary task study. The most significant change was the addition of two extra diary entries to the training task. Particular care was taken to ensure that the new diary entries matched those used in the first study (Chapter Six) for structure, layout, length and valence, making it unlikely that the entries themselves lead to the non-significant result. Conversely, it is possible that the inclusion of two extra diary tasks was too much for the participants. Feedback from participants in the continuation booklet indicated that participants got restless and found it difficult to focus on the entries towards the end of the study.

Based on these limitations, several suggestions can be made should the SST or diary training task be used in future studies. In relation to the SST, the use of participants who are susceptible to mood induction procedures would be advantageous, to make sure that negative SAMs are activated. Ideally, currently-dysphoric participants, not

requiring a mood induction procedure would be used. As suggested by Richards, Blanchette & Munjiza (2007), it is important to investigate the effects on cognitive processes of both naturally occurring and experimentally induced moods as they can have very different effects. Thus before such tasks can be applied to clinically depressed patients, the effects on naturally occurring dysphoria must be investigated.

More robust effects on mood may be achieved if additional contextual questions were included amongst the Velten Primes. Increasing the number of questions would further encourage participants to think about the context of their mood, and more likely have an affect on mood. Alternatively, rather than increasing the number of questions, instead of simply reading the unscrambled version of the questions back to themselves, participants could complete a more active task on the unscrambled question. For example, participants could be asked to write a one line answer in response to the question. This would force participants to think about the question and to directly consider their mood within a broader context. As suggest by Yiend et al. (2005), tasks requiring active participation are more effective than passive ones in affecting mood.

In relation to the diary tasks, it is possible that participants were asked to complete too many entries in the second diary task study. In view of the encouraging findings discussed in Chapter Six, future studies should revert back to including just four entries. As suggested for the SST, a more active task that requires participants to process the content of the entries may be more effective than counting the number of words with two syllables after completion of the diary entry. Feedback from

participants suggested that some switched to auto-pilot for this task, as it became like a “drill exercise”.

Finally, both the SST and diary task would likely benefit from personalisation. Crane et al. (2007) suggested that OGM on the AMT was increased when cue words were self-relevant, as they triggered processing typically associated with depressive episodes. Personalising the tasks so they directly relate to participants’ individual concerns may lead to greater reductions in despondency. Material that participants can identify with may help provide a more realistic idea of how to apply contextual interpretations to their own concerns.

### *8.33 Limitations of the cognitive representations tasks*

Chapter Two investigated the apparent discontinuity between cognitive theories of depression (Beck, 1976; Abramson et al., 1989) and AMT study findings. The findings indicated that positive overgeneral recall on the AMT is a feature of task demands rather than an accurate representation of overgeneralisations in the depressed. As such, the experiments carried out for the remainder of the PhD attempted to use alternative measures of contextual representations.

The stream of consciousness task described in Chapter Two, although naturalistic, was not structured enough. The prose that emerged was disjointed and difficult to code, and overall did not refer to participants’ feelings. As both the contextual SSTs and the contextual diary entries were encouraging participants to consider negative mood within a broader context, it was important that the measure of cognitive representations



allowed participants to discuss their thoughts and feelings in relation to negative events. To achieve this, the experiments presented in Chapters Three and Six required participants to write about a personal negative event. Although still a naturalistic task, which was relevant to each participant and did not present time constraints, this task also had limitations. The task resulted in the recall of notably more general than contextual utterances (regardless of valence) in contextual and control groups, possibly resulting in floor effects as the number of contextual utterances was very low. A further limitation relates to the use of the task in different research studies. Although high inter-rater reliability was achieved using the coding frame, it was felt that verbal training in how to use the frame is needed rather than just a written explanation. This is due to the variability of topics, thoughts and feelings in the essays. The distinction between contextual and general utterances is also complex and takes time to get used to: a contextual utterance must contain two or more of a specific time, place, person or object, whereas a general utterance can contain one of the contextual criteria, but must also contain a general reference to time, places, people or objects. The second coders often found this confusing, which made the essays timely to code.

For the study presented in Chapter Five, a new measure for identifying cognitive representations was developed: the mood reflection task (MRT). To make sure that the measure was accessible and efficient to use, a more structured approach was taken. Although the MRT is easy to complete and code, whether it accurately identifies contextual interpretations of a negative event is difficult to discern. As reported in Chapter Five, participants who unscrambled the specific and contextual versions of the SST did not rate their mood as less despondent than the control group after the SST.

This implies that the contextual questions were not effective at reducing the activation of overgeneral SAMs. Thus it is unlikely that participants in the contextual groups would go on to contextually interpret a subsequent negative event. Therefore to better establish whether the MRT can identify contextual interpretations of negative situations the task should be used in future investigations.

Due to the uncertainty surrounding the reliability of the MRT, it would be advantageous for future research to include a more established measure of contextual versus general cognitive representations in addition to the MRT. The Content Analysis of Verbatim Explanations (CAVE) technique (Peterson & Seligman, 1984) has been used to code essays detailing events and explanations for these events (e.g. Peterson, Bettes, & Seligman, 1985; Riskind, Castellon, & Beck, 1989). This technique extracts events from participants' essays and codes each event on a seven point-scale for internality, stability and globality. Future studies could ask participants to write about a negative event, which could be coded using the CAVE technique in conjunction with the MRT. Findings from the two measures could then be correlated to see whether participants scoring low on stability and globality using the CAVE, also respond more contextually on the MRT.

#### *8.34 Limitations of the mood induction procedures*

The SST studies (Chapters Three, Four and Five) all included a sad mood induction procedure (MIP). The first SST study used the musical MIP described by Watkins et al. (2003), which they found successfully induced a sad mood in 75% of participants (a level similar to previous studies, e.g. Clark, 1983; Martin, 1999). Evident from this,

although musical MIPs have been found to be reliable at inducing a sad mood, they are not the most efficient method (Westermann, Spies, Stahl, & Hesse, 1996). Consistent with this, the MIP was only effective on 61% of participants in the first SST study, a level lower than that found previously. As such, a more efficient (Gross & Levenson, 1995; Westermann et al., 1996) film MIP was used in the second SST study.

Although a sad mood was successfully induced in 79% of participants, making it more efficient than the music MIP, it was suggested that an external rather than internal sad mood was induced. In keeping with this, significant differences in despondency after the SST between the contextual and control groups were not found, possibly because participants felt detached from their negative mood. As suggested by van der Does (2002), although the clip from *The Champ* is saddening, the scene does not necessarily hold personal significance to the audience, therefore it is not necessarily an ideal probe for depression research.

As such, the MIP used for the third SST study (Chapter Five) reverted back to the MIP used by Watkins et al. Although a similar proportion of participants to those in Chapter Three were successfully induced in to a sad mood (67%), mean pre-SST despondency scores in the specific- and unstable-contextual groups were at least 10 points lower than those reported in Chapter Three. Post-SST despondency was not found to be significantly lower in the contextual groups than the control group, possibly because they were less despondent to start with.

The SST studies illustrate the difficulty of using MIPs and the impact MIPs can have on tasks that have previously been found to have significant effects. In addition to finding an MIP that induces the required mood in the majority of participants, it is also important to make sure that the MIP induces the right type of mood (i.e. for depression research, a sad mood focused on one's own feelings). However, even when the correct mood is induced, there is no guarantee that this will be enough, as evident in Chapter Five. One's susceptibility to MIPs and the period over which the induced mood will last is subject to individual differences. Importantly, research relying on experimentally induced moods should evaluate results with caution and compare these results to effects on naturally occurring mood. As suggested by Richards, Blanchette and Munjiza (2007) there is evidence that naturally occurring and experimentally induced moods can have different, or even opposite effects on cognitive processes. Therefore when a MIP is necessary, although not flawless, it is suggested that future studies investigating depression use the music MIP presented in this thesis, but that researchers should be prepared to have to turn away volunteers who do not show an increase in sad mood of at least 20 points. To be more confident that the MIP has been effective, a higher minimum increase in sad mood could be employed.

### *8.35 Limitations of the mood scales*

Visual analogue scales (VASs) were used to rate despondent, happy and anxious mood in the SST and diary task studies (Chapters Three to Seven). There are several advantages of using VASs: they are easy to use; place minimal demands on participants; they are quick to score; and the numerical scores can be treated statistically. On the downside, the scales are very subjective and open to differences in

interpretation of the scales. This is an important limitation for the research in this thesis, which relies on accurate scoring of mood from one task to another. This is particularly important pre- and post-MIP where participants who record an increase in despondency of less than 20 points were not included in the research. Conceptually however, VASs are complex as it is assumed that individuals can accurately translate a feeling into a numerical format. Finally, they are more susceptible to expectancy effects, where participants can easily rate their mood to reflect what they think the experimenter is looking for. If the research presented were to be replicated, it is suggested that additional mood measures such as the PANAS (the Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988) are included to support VAS data.

#### ***8.4 Relationship to current research and implications***

The research presented in this thesis draws on cognitive theories of depression, specifically Beck's (1976) cognitive theory, Abramson et al.'s (1989) hopelessness theory, and Brewin's (1989) DRT. These theories formed the foundations for investigating the characteristics and role of overgeneralisations in depression, and the use of contextual manipulations in reducing the effects of overgeneralisations on despondency.

Unlike AMT findings, which suggest that the depressed recall OGMs to positive and negative cue words, Beck (1976) and Abramson et al. (1989) suggest that depression is associated with negative (and not positive) overgeneral interpretations of events. Consistent with cognitive theories, the data presented in Chapter Two suggest that

compared to never- and formerly-depressed participants, currently-dysphoric participants show a negative, but not a positive, overgeneral recall bias. These findings add to recent literature suggesting that overgeneral responses on the AMT may be indicative of difficulties with AMT compliance. Rottenberg et al. (2006) criticised the AMT for imposing time constraints and forcing participants to respond to cue words that are not necessarily relevant to the depressed person. Rottenberg et al. interviewed participants about their saddest and happiest lifetime events, a method they considered to be more ecologically valid, without time constraints, and which focused on events meaningful to the individual. Analysis of participants' memories indicated that although no group differences were found in retrieval of sad memories, compared to the formerly- and never-depressed groups, the currently-depressed group's happiest memories were less detailed, harder to retrieve, and less emotional. As with the findings in Chapter Two, Rottenberg et al.'s data indicate a tendency for the depressed to more readily recall sad than happy memories.

In support of Rottenberg et al.'s suggestion that responses on the AMT may be confounded by cue relevance to the depressed person's concerns, Crane, Barnhofer and Williams (2007) suggested that overgeneral memory recall on the AMT is related to cue self-relevance. A highly significant negative correlation was found for formerly-depressed participants, but not never-depressed participants, between cue self-relevance and memory specificity, with a greater number of self-relevant cues leading to recall of fewer specific memories.

Finally, powerful evidence that findings on the AMT are likely due to features of the task comes from a series of studies by Dalgleish, Perkins, Williams, Golden, Barrett et al. (2007). Their research not only demonstrated that by reversing task instructions the depressed can be made to produce more specific memories; but also provided evidence that, independent of depressed mood, the AMT is dependent on working memory capacity (WMC), which in turn can affect task performance caused by difficulties in following task instructions.

Therefore, the data presented in Chapter Two indicates, as suggested by Beck (1976), and Abramson et al. (1989), that depression is associated with a tendency to make negative overgeneral interpretations about events, but not positive ones as indicated by AMT findings. The findings suggest that investigations of depressed participants' memories should use tasks that do not impose time constraints, are relevant to the individual, are easy to follow, and do not place demands on WMC. These were all factors taken in to account when developing a task to measure cognitive representations for the studies presented in Chapters Three to Six.

Rather than looking at the characteristics of overgeneralisations in depression, Chapters Three, Four and Five investigated a mechanism proposed in Brewin's (1989) DRT. Brewin suggests that making individuals aware of the contextual features of their feelings and situations should reduce the activation of overgeneral representations. Unlike Beck's and Abramson et al.'s theories of depression, which present a direct single route through which negative cognitions can lead to depression, DRT presents two routes. Multi-level models such as DRT suggest that the same event

can be represented at different levels, containing different information, which can have different effects on emotion. Such models are able to explain how the depressed may be able to verbally rationalise overgeneral negative thoughts yet still feel depressed.

DRT differentiates between consciously available VAMs, which contain contextual details about events that can be accessed and manipulated to interpret and classify subsequent experiences, and unconscious SAMs. SAMs consist of “gist” information formed from summaries of similar past experiences. Brewin suggests that emotion can be both consciously and unconsciously activated: consciously via the processing of VAMs, and unconsciously through the activation of SAMs. Emotional disorders such as depression are thought to arise when negative SAMs are automatically triggered by physical features or meanings of a current event matching an original emotional event. This can activate cognitive, emotional and behavioural representations encoded with the original event. This indicates that although an individual may be able to rationalise their feelings or the outcomes of events using VAMs, they are unable to control their automatic emotional responses governed by SAMs. Brewin suggests that the effects of SAMs could be reduced through therapy by manipulating the access of VAMs and SAMs in three ways, one of which was that therapy could aim to “*modify access to nonconscious situational memories*”. Brewin suggested that one way to modify access is by disrupting the feedback loop to prevent SAMs accessing further SAMs. This proposal was investigated in Chapters Three, Four and Five.

Chapter Three presents a replication and extension of Watkins, Teasdale and Williams’ (2003) study. The procedure employed was based on that of Watkins et al.: After a



MIP, participants unscrambled negative Velten primes and either unstable-contextual questions (Watkins et al.), control questions (Watkins et al.), or newly developed specific-contextual questions. The Velten primes were suggested to act like negative SAMs, priming negative mood. The contextual questions were designed to put this mood in to context by increasing retrieval of VAMs. Increased retrieval of VAMs, which link negative experiences to unique aspects of the situation, should then reduce negative mood as a more rational interpretation of the present mood is made. In support of Watkins et al.'s findings, despondency was successfully reduced in the group which unscrambled the unstable-contextual questions, but not the control questions. These results also support those of Philippot, Schaefer and Herbette (2003). They found that priming a specific access mode to autobiographical memory compared to an overgeneral mode resulted in less emotion on a mental-imagery task, where participants re-evoked previously recorded emotional events.

Despite successful replication of Watkins et al.'s results in Chapter Three, the data in Chapter Four did not support these results, and analysis of the data in Chapter Five fell just above the 0.05 significance level. Similarly, the specific-contextual questions for the experiments in this thesis were not successful at reducing despondency. As suggested in section 8.3 of this chapter, failure of the contextual questions to significantly reduce despondent mood may have been due to methodological limitations. The theoretical justification for the development of specific-contextual questions was based on Abramson et al.'s (1989) hopelessness theory. As discussed in the literature review (Chapter One), depression is suggested to be most likely to develop when individuals attribute negative events to generalised stable and global

causes, rather than contextual unstable and specific causes. The contextual questions developed by Watkins et al. (2003) encouraged participants to view their mood as changing over time, promoting an unstable interpretation of mood. Implicit in hopelessness theory, questions encouraging participants to interpret their mood as changing over events should also reduce despondency. As such, a set of specific-contextual questions was developed.

The failure of the specific-contextual questions to reduce despondency could indicate that specific interpretations are not as effective as unstable ones in contextualising mood. DRT suggests that SAMs contain gist information regarding similar events (e.g. 'birthdays', 'holidays', 'exams'), rather than grouping different events together that occurred at a similar time. As such, it is possible that encouraging patients to acknowledge that they can feel differently across different periods in time is a more efficient tool for relieving depressed mood as SAMs are less likely to contain contrasting information suggesting that participants remained despondent over a prolonged period of time. This may imply, contrary to Abramson et al. that stable and global factors do not hold equal importance in their contribution to depression; or that stable factors are easier to manipulate than global factors.

The mechanism proposed in DRT is further investigated in the diary task studies (Chapters Six and Seven). The primary aim of these chapters was to develop a training task that encourages currently-dysphoric participants to interpret negative events using contextual information. The theoretical justification for this was synonymous with that of the SST studies. It was speculated that encouraging participants to incorporate

contextual information in to their interpretations of negative events would reduce retrieval of SAMs and increase retrieval of VAMs (and therefore reduced despondent mood). Support for this mechanism and for the use of interpretive training tasks in depression was initially found (Chapter Six), however these results were not replicated in Chapter Seven. Several methodological limitations for this disparity in results are suggested (section 8.3).

Although the research presented in this thesis has the primary aim of providing evidence for the mechanism proposed in DRT, the research is also consistent with cognitive (Beck, 1976) and hopelessness (Abramson et al., 1989) theories of depression. It should be noted that an objective of the research was not to falsify cognitive and hopelessness theories, but to expand on the limited research presented that investigates DRT. The findings of the studies presented in chapters Three and Six, as well as supporting DRT (as discussed), are also consistent with hopelessness and cognitive theories. The significantly lower levels of despondency reported after the SST and diary task in chapters Three and Six are in keeping with the implications of cognitive and hopelessness theories: that encouraging participants to frame negative events within a specific context could reduced despondent mood by reducing negative overgeneral (both global and stable) interpretations of events. Therefore, rather than presenting opposing theories of the effects and manipulation of negative overgeneralisations on depression, cognitive, hopelessness and dual representation theories can be seen to compliment each other, with DRT addressing some of the limitations that single-route theories such as cognitive and hopelessness theories

present to understanding the causes and maintenance of depression (see Chapter One, section 1.4 for a discussion of the advantages of multi-level theories of depression).

The inconsistencies between the findings across the studies presented are consistent with the differing results cited in the published literature. Whereas Watkins et al. (2003) found that participants who unscrambled contextual questions did show a significant decrease in despondent mood compared to the control group, Watkins, Teasdale and Williams (2000) did not find such a difference. These inconsistencies suggest that further investigation using the SST is needed to establish whether the mixed results are due to methodological differences. Similarly, findings from both the published literature on interpretive training biases and from the studies in Chapters Six and Seven suggest that despondency is not always reliably reduced by training. For example, Mathews and Mackintosh (2000) and Yiend et al. (2006) have provided evidence of training-congruent mood changes directly after interpretive training tasks. Conversely, MacLeod et al. (2002) and Wilson et al. (2006) did not find mood changes after training, but did find training-congruent mood changes after exposure to stressful stimuli. Similarly, very limited evidence for the effects of interpretive bias on depressed mood has been published. Only MacLeod et al. (2002) have successfully induced training-congruent changes in depressed mood, and this was only when mean depression scores were combined with mean anxiety scores.

A series of studies recently conducted by Neumann and Philippot (In press) present another possible explanation for the inconsistency in the data presented in this thesis. Similar to the objectives of the SST and diary task studies, Neumann and Philippot

aimed to reduce the emotional intensity associated with autobiographical memories by manipulating the mode of processing and the type of information processed. Emotional intensity was most effectively reduced when a specific mode of processing was accessed, and when participants were encouraged to focus on the features of an event that made it unique. Neumann and Philippot stress that the unique contextual details recalled must consist of schema-irrelevant information to prevent the activation of generalised emotional schema. This is consistent with DRT (Brewin, 1989), whereby information associated with a contextual VAM could activate a generalised SAM. If this were to occur, then the contextual features of the situation would be overshadowed by the generic features associated with the schema. Therefore, activation of a contextual processing mode alone is not enough to reduce despondency; identification of unique schema-irrelevant information is also needed. It is possible that the SST and diary task only activated a contextual mode of processing and did not force participants to think about the unique features of different situations. Despite the SST encouraging participants to think about their mood changing over time and events, and the diary task putting different events in to context, the tasks did not get participants to think about their own experiences and what makes them unique. Thus, developing tasks that manipulate the type of information processed and the mode of processing activated may lead to more consistent effects on mood. One way to do this is to personalise training tasks to enable participants to identify unique aspects of their own experiences, rather than simply encouraging a contextual mode of processing.

As evident from Neumann and Philippot's work (In press), the research area focused on in the present thesis is also of considerable interest in the recently published

literature. The relationship between emotional intensity and specific versus overgeneral processing, and the use of different tasks to manipulate processing biases is receiving a growing amount of attention. In addition to the interpretive training tasks that the diary studies were based on (Chapters Six and Seven), alternative methods of manipulating the processing of information have also been developed. As mentioned previously, Philippot, Schaefer and Herbette (2003) primed either a specific or an overgeneral access mode to autobiographical memories. In support of Neumann and Philippot (In press), Philippot et al. (2003) found that greater emotional intensity was associated with activation of an overgeneral access mode rather than a specific access mode to autobiographical memories.

In addition to demonstrating that emotion intensity is associated with the mode of processing activated (specific versus general), Neumann and Philippot demonstrated the importance of the type of information processed to emotional intensity. Their findings indicate that key to the reduction of emotional intensity is not just the activation of a specific mode of processing, but the uniqueness of the information processed. To maximise a reduction in emotion intensity, the information activated must not be associated with generic schemata, which lead to the activation of overgeneral memories and emotion.

Neumann and Philippot (In press) suggest that the importance of both the mode of processing and the type of information processed to emotional reactions is consistent with cognitive multilevel models of emotion. As touched upon earlier (page 251), this is where DRT overcomes one of the limitations of cognitive and hopelessness theories

of depression: the single-route to emotion proposed by these theories cannot account for the separation of emotional and intellectual information. This is why it is important to expand research investigating the mechanisms proposed in multi-level models of depression, whilst acknowledging the assumptions presented by cognitive and hopelessness theories. As suggested in Brewin's DRT (1989, 2006), emotional and factual information about an event can be stored separately. Whereas the rational, contextual information detailing what makes that event unique is stored in VAMs, emotionally charged information common to similar experiences is stored in SAMs. In addition to containing different types of information, activation of verbally versus situationally accessible memories can also lead to different emotional reactions. Whereas emotional reactions to consciously accessible VAMs can be rationalised and considered in relation to the context of the situation, emotional reactions to SAMs are automatic, overgeneral and irrational. Therefore, as investigated by the SST and diary studies in this thesis, Philippot et al. (2003), and Neumann and Philippot (In press), activation of a contextual mode of processing (i.e. of VAMs) should lead to less emotional responses.

However, the theoretical basis of the work presented in this thesis, and that of Philippot et al. (2003), and Neumann and Philippot (In press) is inconsistent with Williams' (1996) affect regulation account. As discussed in the literature review (Chapter One), one explanation for why the depressed tend to recall overgeneral autobiographical memories may be as a defensive coping style. Williams' (1996) affect regulation account suggests that patients, particularly those who have experienced childhood adversities, may recall overgeneral memories to regulate or minimise the

negative affect associated with specific memories. Similarly, Kuyken and Brewin (1995) suggest that depressed patients who have undergone a traumatic event retrieve OGMs as a defensive cognitive style designed to restrict access to painful memories. Such explanations suggest that OGM should be associated with *less* emotionality, rather than *more*, as suggested by DRT and in Philippot's work.

In support of the affect regulation account, Raes, Hermans, de Decker, Eelen and Williams (2003) found that high-specific individuals, who retrieved specific memories to each of 10 cue words on the AMT, compared to low-specific individuals (retrieved six or fewer specific memories on the AMT), were more distressed after a negative stressful task. High-specific individuals also thought more frequently about the negative event, and reported that they found thinking about the event to be more unpleasant and disturbing. Therefore there is support for the contrasting hypotheses that specificity can lead to more and less emotionality.

To address these conflicting accounts, Raes, Hermans, Williams and Eelen (2006) carried out two studies. The first was a replication of Raes et al.'s (2003) study, and did again find that high-specific individuals were more distressed after a negative experience than low-specific individuals. The second study investigated whether the discrepancy between the findings of their first study and those of Raes et al. (2003), compared to those of Philippot et al. (2003) were due to experimental design. Raes et al. (2006) observe that where as Raes et al. (2003) compare naturally occurring "trait" specificity, Philippot et al. experimentally manipulate "state" specificity by allocating participants to either an overgeneral or specific access mode condition. Raes et al.



(2006) therefore suggest that individuals can be low-specific in relation to finding it difficult to retrieve specific memories, without necessarily summarising memories and being overgeneral in their recall.

To investigate whether a distinction between state and trait specificity can account for the conflicting results, Raes et al. (2006) induced either an overgeneral or specific retrieval style in low-specific individuals (those who recalled six or fewer specific memories on the AMT). Consistent with prediction, Raes et al. found that when induced to retrieve overgeneral memories, low-specific individuals would experience more intense negative affect than when induced to retrieve specific memories. I.e., when an overgeneral or specific processing mode is activated, low-specific individuals experience more or less (respectively) intense emotion. Thus it seems that it is both the mode of processing and the type of information accessed that determines one's emotional response.

As noted, Neumann and Philippot (In press) suggest that the key to reducing negative affect is in identifying information that is unique to an event and unrelated to any existing schema, not simply through activation of a specific processing mode. This important distinction may provide a further explanation for the inconsistent findings of the SST studies and diary studies presented in this thesis. Neumann and Philippot's findings imply that even if the SST and diary tasks were successful at activating a contextual mode of processing, emotionality would only be affected if participants also considered details unique to negative events. As suggested by the lack of difference in contextual versus general utterances recalled after the SST manipulation in Chapter

Four, and after the diary task in Chapter Six, participants in the contextual groups did not appear to be retrieving more contextual details about the negative event described. Therefore, even if a contextual mode of processing was primed by the tasks, this would not have been enough to reduce negative affect.

Philippot et al.'s (2003) and Neumann and Philippot's (In press) studies also emphasise the importance of personalising training materials. To encourage participants to use a contextual processing mode, as well as thinking about the specific details unique to a negative event, the materials used for training need to be relevant to a negative event experienced by the participant. Philippot et al. achieved this in their study by getting participants to keep a 12 day diary of negative events that occurred. These events were then referred back to and explored during the experiment and participants asked to recall them after either general or specific priming. Importantly, and in contrast to the SST and diary tasks, participants were learning how to access the contextual details of their own negative experiences, rather than being primed to access a contextual processing mode in relation to negative events that they had not personally experienced. It is possible that the success of the SST and diary tasks across the different studies was confounded by the relevance of the pre-prepared materials to participants' own experiences and thoughts concerning negative events.

However, a disadvantage of the above studies is their reliance on the AMT to classify participants as high- or low-specific. As discussed in Chapter Two of this thesis, an excess of responses defined as overgeneral by the AMT does not necessarily imply the existence of generalized memory representations. Potential limitations of the AMT

procedure and their effects on recall are also cited by Raes et al. (2006). They suggest even individuals who have a tendency to revert to an overgeneral retrieval style, may still be able to recall specific memories in response cue words when instructed to do so.

In keeping with the possible procedural limitations of the AMT as a tool for investigating overgenerality to positive and negative cues in depression, recent studies have further demonstrated the association of depression with negative rather than positive stimuli. Shane and Peterson (2007) demonstrated that dysphoric individuals tend to show an attentional bias away from positive and towards negative stimuli, and that this bias is greater than that by non-dysphoric participants. Similarly, O'Connor and Cassidy (2007) demonstrated that participants who show low levels of positive future thinking show increased hopelessness. This is consistent with Abramson et al.'s (1989) hopelessness theory, which suggests that hopelessness, which leads to depression, is associated with negative, rather than positive, global and stable interpretations. As suggested by O'Connor and Cassidy, investigating the relationship between future expectations and optimism/pessimism is of clinical interest, as the types of cognitions that need to be addressed by therapy can be identified. Similarly, the research presented in this thesis has clinical implications.

Drawing on the success of interpretive training tasks on anxiety levels (e.g. Campbell, Rutherford & MacLeod, 2002), Yiend and Mackintosh (2004) allude to the potential use of training techniques in therapy for anxiety. Even at this early stage of the research, the existence of effects such as that found in Chapter Six strengthen the

theoretical basis of cognitive-behaviour therapy by helping to confirm the casual impact of thinking styles on mood. As discussed, there are several limitations of the research that need to be addressed and further attempts made to significantly reduce despondency using the training tasks. Recent literature purports the importance of not only manipulating the mode of processing, as was attempted in the SST and diary task studies, but also the type of information accessed. This implies that training tasks should address both these types of processing, possibly by designing training tasks that can be personalised to each individual's personal experiences. In the longer term, it is possible that such tasks may become a useful adjunct to traditional forms of therapy, either in enhancing resiliency to future stressors or in directly combating negative moods.

### ***8.5 Future research and conclusion***

The preliminary nature of the paradigms used and the mixed results discussed in this thesis present a number of unanswered questions that can be addressed in future research. Several modifications to the materials used throughout this thesis are suggested in section 8.3 of this chapter. Rather than reiterate these, suggestions regarding the next stage for each of the three research areas presented in this thesis (i. cognitive theories vs. AMT data; ii. SST studies; iii. diary task studies) are given. Firstly, in relation to the study presented in Chapter Two, further research of memories of the currently-, never- and formerly-depressed is needed to elaborate on the apparent inconsistencies between AMT data and cognitive theory. The data presented suggest the importance of using multiple methods to determine that altered performance on memory tasks can be attributed to characteristics of memory representations. Stronger

support for the suggested limitations of the AMT would be gained by repeating the study with the inclusion of the AMT. Specificity of memories recalled from the AMT and from the essay task could then be compared.

In relation to the SST studies, it would be interesting to see whether the contextual questions would be successful at reducing despondency in a currently-depressed group. Chapters Four and Five both suggest that pre-SST despondency could be a factor contributing to the non-significant results: the MIP described in Chapter Four was subsequently thought to induce the wrong type of sad mood; pre-SST despondency scores reported in Chapter Five were observed to be notably lower than those reported in Chapter Three. A currently-depressed group should naturally be experiencing a certain amount of despondency, and more importantly, are likely to be spontaneously experiencing the types of thoughts primed by the negative Velten statements. Thus the contextual questions would be more relevant, and results would be of greater clinical significance.

Similarly, repetition of the diary training task study described in Chapter Six with a clinically diagnosed currently-depressed rather than currently-dysphoric sample would strengthen results. The results of this study suggest for the first time that knowledge about cognitive biases in depression can, like corresponding knowledge about anxiety, be applied to the development of training tasks designed to manipulate vulnerable thinking styles. At present it is far from clear what are the principles that might underlie effective training or, as evident from the non-significant results presented in Chapter Seven, how to best achieve results in practice. As suggested in Chapter Seven,

it is possible that too many extra variables were introduced to the study, which confounded results. Repetition of the paradigm presented in Chapter Six is therefore suggested. Following successful replication of the original paradigm, as was the aim of the second diary task study, a number of important questions can then be addressed. One aim of future research should be to discover over what time period training is able to reduce vulnerability to a mood challenge. A second aim is to establish whether more widespread effects on chronic levels of sad mood can be achieved. Finally, future studies will need to test generalisability to individuals with diagnosable disorders.

In conclusion, only limited support for the mechanism proposed in DRT is presented in this thesis. However it should be noted that the research presented in this thesis is based on theories and paradigms that are either new to the field, or which have only received limited investigation in the literature. As discussed, OGM in depression is most frequently assessed using the AMT. It is only in recent years that studies such as those by Rottenberg et al. (2006), Crane et al. (2007), and Dalgleish et al. (2007) have begun to question the validity of AMT results and the susceptibility of recall on the AMT to methodological factors. Until an alternative and reliable method of overgeneral memory analysis is available, conclusions about the effectiveness of tasks such as the SST and the diary training task in reducing overgeneral interpretations will be difficult to make. Although attempts to develop a new task to identify contextual versus general cognitive representations were made in this thesis, further investigation is needed. This is particularly true for the mood reflection task presented in Chapter Five, the reliability of which could not be assessed due to lack of group differences in despondent mood after the SST. Development of an accurate and reliable measure of

cognitive representations will enable future research to evaluate whether the effects of contextual manipulation tasks on mood are indeed the result of changes in the cognitive representations of memories (as suggested in DRT), or due to some other factor. As suggested by Neumann and Philippot (In press) it is not only the mode of processing activated, but also the type of information processed that is important when manipulating emotion. As such, tasks such as the SST and diary task would likely benefit from personalisation so that both processing mode and type of information are targeted. Further investigation and refinement of such interpretive bias tasks will allow for the eventual incorporation of training tasks in to cognitive therapy for depression.

To summarise, considering the research conducted for this thesis as a whole, several lessons can be drawn from the studies: Firstly, the difficulty and limitations of using mood induction procedures to investigate cognitive mechanisms in depression are highlighted. Secondly, as found within the published literature, the studies presented demonstrate the difficulty of replicating findings using contextual manipulation tasks. The importance of designing active rather than passive tasks (Yiend & Mackintosh, 2004); personalising material (Crane et al., 2007); and of manipulating both the mode of processing and the type of information processed (Neumann & Philippot, in press), is evident from the research presented and consistent with suggestions in the literature.

The findings from the research presented in this thesis are consistent with current research findings, adding to the literature on interpretive bias training, limitations of the AMT, and furthering understanding of the role of OGMs in depression. In sum, the data suggest that AMT results reflect the effect of depression on ability to respond to

the demands of the AMT; that overgeneralisations can be detrimental to despondent mood whereas contextual interpretations can limit despondent mood; and that it is possible to reduce despondency using tasks that encourage a contextual interpretation of negative events. Although not without limitations, it is felt that the overall aim of the thesis, to address the characteristics, role and manipulation of negative overgeneralisations in depression, has been met.



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**APPENDIX A: Examples of Coded Utterances Using the Coding Frame Applied to the Data Presented in Chapter Two**

***Negative contextual memory:***

- I do miss being able to lounge back and relax in my house.
- That day I crawled on my bed and started bawling.
- That left a deep impression on me of how unhappy I was back home.

***Negative general memory:***

- I did things that I was taught were wrong.
- It was too much drinking and sex.
- I had about a week worth of bad days, homesick days.

***Negative general thought:***

- If one is weak when thrown in to this scary place, bad things are bound to occur.
- So I am propelled farther down in to the spiral of self-loathing
- Insecurity in college is not a good thing.

***Positive general thought:***

- I feel less pressure in taking classes I do not like
- I think that the college experience, socially, and academically will be advantageous to me
- The relationship between the few close friends I have will last forever.

**APPENDIX B: Coded Utterance Examples using the Coding Frame for the Data  
Presented in Chapters Three, Four and Six**

***Neutral general:***

- We immediately started spending all our time together
- I was travelling with some friends
- I'm a bit of a tidy freak

***Neutral contextual:***

- I chose a fondue kit
- One day she just tells me she's moving out.
- I went home for a weekend once

***Negative general:***

- although I do miss the friendship
- I felt very angry and disappointed
- my friend and I were no longer getting on

***Negative contextual:***

- At the ceremony I held my negative emotions in.
- Later when I got home I burst in to tears.
- At the time I thought my parents didn't understand.

***Positive general:***

- things anyone could enjoy
- The others were very excited
- Being House Captain was the best thing I could have done.

***Positive contextual:***

- I knew that my person would enjoy my gift
- I think I handled the situation the best that I could.
- I was so happy during the bus ride home.

## **APPENDIX C: Information Sheet for the First SST (Chapter Three)**

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**UCL DEPARTMENT OF PSYCHOLOGY**  
SUB-DEPT OF CLINICAL HEALTH PSYCHOLOGY  
1-19 TORRINGTON PLACE  
LONDON, WC1E



### **Participant Information Sheet**

You have been invited to take part in a research study. Before you decide whether or not you would like to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with me if you wish. Please ask if there is anything that is not clear or if you would like more information.

### **The present study:**

This study has been approved by the University College London's Research Ethics Committee.

The study requires male and female volunteers over the age of 18 years old to carry out several tasks. You will first be asked to fill in a questionnaire about how you have been feeling over the past two weeks and to rate your current mood. You will then be asked to take part in a musical mood induction procedure involving a sad mood induction, followed by a scrambled sentence task where you will be asked to unscramble several sentences. The final part of the study is a stream of consciousness task. At the end of the study you will be debriefed further about the study.

The study is expected to take about 45 minutes and you will be paid £5 for your time.

### **Confidentiality:**

Your data will be collected and stored in accordance with the Data Protection Act.

All data collected for this study will remain anonymous and confidential. Your name will only appear on the consent form, which will be kept separate from all data collected. It is possible that data from this study will be used in subsequent studies, but will remain anonymous.

Please note that participation is voluntary and that you are entitled to withdraw from the study at any point, should you so wish.

Researchers' contact details are printed below should you wish to contact us with any questions about the research.

Thank you for considering participation in this study, a copy of this form and the signed consent form will be made available for you to keep.

### **Principal Researcher:**

Prof. Chris Brewin  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT  
[c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk)

### **Experimenter**

Natalie Jacoby (PhD student at UCL)  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT



**APPENDIX D: Information Sheet for the Second SST (Chapter Four) and First  
Diary Task (Chapter Six) studies**

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**UCL DEPARTMENT OF PSYCHOLOGY**  
SUB-DEPT OF CLINICAL HEALTH PSYCHOLOGY  
1-19 TORRINGTON PLACE  
LONDON, WC1E



**Participant Information Sheet**

You have been invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with me if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

**The present study:**

This study has been approved by the University College London's Research Ethics Committee.

The study requires male and female volunteers over the age of 18 years old to carry out several tasks. You will first be asked to fill in a questionnaire about how you have been feeling over the past two weeks, and to rate your current mood. Depending on which group you are allocated to, you may or may not be asked to take part in a mood induction procedure involving a sad mood induction using a film clip, followed by a scrambled sentence task, where you will be asked to unscramble several sentences. Participants who do not undergo the mood induction procedure will be asked to read a diary entry and select particular words and phrases to complete the sentences. The final part of the study is an imaginative thinking task, which will ask you to write about a particular time in your life. At the end of the study you will be debriefed further about the study. The study is expected to take about one hour, and you will be paid £6 for your time.

**Confidentiality:**

Your data will be collected and stored in accordance with the Data Protection Act.

All data collected for this study will remain anonymous and confidential. Your name will only appear on the consent form, which will be kept separate from all data collected. It is possible that data from this study will be used in subsequent studies, but will remain anonymous.

Please note that participation is voluntary and that you are entitled to withdraw from the study at any point, should you so wish.

Researchers' contact details will be made available to you should you wish to contact us with any questions about the research.

Thank you for considering participation in this study, a copy of this form and the signed consent form will be made available for you to keep.

**Principal Researcher:**

Prof. Chris Brewin  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT  
[c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk)

**Experimenter**

Natalie Jacoby (PhD student at UCL)  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT

## **APPENDIX E: Information Sheet for the Third SST (Chapter Five) and Second Diary Task (Chapter Seven) studies**

**UCL DEPARTMENT OF PSYCHOLOGY**  
SUB-DEPT OF CLINICAL HEALTH PSYCHOLOGY  
1-19 TORRINGTON PLACE  
LONDON, WC1E



### **Participant Information Sheet**

You have been invited to take part in a research study. Please take time to read the following information carefully and discuss it with me if you wish. The following information will describe what you will be asked to do during the study. A full explanation as to why this research is being carried out will be given at the end of the study via a debriefing sheet. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

### **The present study:**

This study has been approved by the University College London's Research Ethics Committee. The study requires male and female volunteers over the age of 18 years old to carry out several tasks. You will first be asked to fill in a questionnaire about how you have been feeling over the past week and to rate your current mood. Depending on which group you are allocated to, you may or may not be asked to take part in a sad mood induction procedure

Participants completing the mood induction version of the study will be asked to complete a scrambled sentences task where you will be asked to unscramble several sentences. This will be followed by a mood reflection task where you will be asked to state how accurately several sentences reflect how you would react to a negative situation. This will take approximately one hour and you will be paid £6 for your time.

Participants allocated to the other version of the study will not do the mood induction procedure. Participants completing this version of the study will be paid £20. The study will take up to 1½ hours on the day and will also require the completion of a continuation booklet over the following 5 days. You will be asked to complete several diary entry tasks, which require you to choose certain words to complete the gaps in diary entries. After this task you will complete some "spot-the-difference" puzzles, followed by a writing task which asks you to write about a particular time in your life. The continuation booklet involves the completion of one diary task each day for four days and completion of a feedback sheet on the fifth (this will take approximately 5 minutes each day).

### **Confidentiality:**

Your data will be collected and stored in accordance with the Data Protection Act. All data collected for this study will remain anonymous and confidential. Your name will only appear on the consent form, which will be kept separate from all data collected. It is possible that data from this study will be used in subsequent studies, but will remain anonymous. Please note that participation is voluntary and that you are entitled to withdraw from the study at any point, should you so wish.

Researchers' contact details are available below should you wish to contact us with any questions about the research. Thank you for considering participation in this study, a copy of this form and the signed consent form will be made available for you to keep.

### **Principal Researcher:**

Prof. Chris Brewin  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT  
[c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk)

### **Experimenter**

Natalie Jacoby (PhD student at UCL)  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT

## **APPENDIX F: Informed Consent Form**

**UCL DEPARTMENT OF PSYCHOLOGY**  
SUB-DEPT OF CLINICAL HEALTH PSYCHOLOGY  
1-19 TORRINGTON PLACE  
LONDON, WC1E



### **Informed Consent Form**

#### **CONFIDENTIAL**

**Title of Project:** Effects of contextual training on depressed mood

	<b>YES</b>	<b>NO</b>
Have you read the Participant Information Sheet?		
Have you had the opportunity to ask questions and discuss the study?		
Have you received satisfactory answers to all your questions?		
Have you received enough information about the study?		
Do you understand that you are free to withdraw from the study without penalty at any stage?		
Do you agree with the publication of the results of this study in an appropriate outlet/s?		

**Signature of participant:** .....

**Date:** .....

**Full name in capitals:**

.....

**Signature of experimenter:** .....

**Date:** .....

**Full name in capitals:** .....

**APPENDIX G: Debriefing Sheet for the SST Studies**  
**(Chapters Three, Four and Five)**

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**UCL DEPARTMENT OF PSYCHOLOGY**  
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The project you have just participated in was investigating the role of contextual thinking in depression. It was part of my Ph.D. research which I am conducting in the Department of Psychology, University College London.

The way we encode, store and retrieve memories can affect the way we interpret different situations and how we feel in response to these. It is possible that depression may be related to having a negative frame of mind towards everything – i.e., thinking very generally. This could cause a depressed mood regardless of the situation. This is referred to as a ‘global’ way of storing memories, i.e. negative emotions are attached to all *events* regardless of the context. It could also be referred to as a ‘stable’ way of storing memories if the negative emotion is attached to periods of time rather than events, i.e. a negative emotion is present over different *periods of time* in one’s life. This study aims to investigate whether encouraging people to encode specific contexts (specific times and places) in to their memories, will make people think less globally (they are aware that different feelings are related to different events), or in a less stable manner (they realise they have felt differently over different times in their lives), or even both.

This was investigated by randomly allocating participants to one of three groups: a specific-contextual group (minimise global thinking), an unstable-contextual group (minimise stable thinking), or a control group (does not manipulate thinking at all). All groups undertook the same tasks, except that nine of the sentences in the ‘scrambled sentence’ task were engineered to differ for each group of participants to encourage either specific, unstable, or neither type of thinking. By comparing the mood ratings between these groups and the thoughts and feelings recorded during the think aloud task, one should be able to see whether contextual thinking decreases a sad mood and whether contextual thinking was actually taking place after the sentences task. The mood reflection task was included to see whether participants in the contextual groups, compared to the control group, would rate contextual statements as more accurately reflecting how they would feel in that situation.

If you have any more questions about the study, or would like to be forwarded the results, please contact me at [c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk). Furthermore, if you are concerned that you are still feeling sad after this study, please also contact me. You may also contact Chris Brewin who is a qualified clinical psychologist employed by University College London (telephone 0207 679 5927; email [c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk)).

**APPENDIX H: Debriefing Sheet for the Diary Task Studies**  
**(Chapters Six and Seven)**

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**UCL DEPARTMENT OF PSYCHOLOGY**  
SUB-DEPT OF CLINICAL HEALTH PSYCHOLOGY  
1-19 TORRINGTON PLACE  
LONDON, WC1E



The project you have just participated in was investigating the role of contextual thinking in depression. It was part of my Ph.D. research which I am conducting in the Department of Psychology, University College London.

The way we encode, store and retrieve memories can affect the way we interpret different situations and how we feel in response to these. It is possible that depression may be related to having a negative frame of mind towards everything – i.e., thinking very generally. This could cause a depressed mood regardless of the situation. This is referred to as a ‘global’ way of storing memories, i.e. negative emotions are attached to all *events* regardless of the context. It could also be referred to as a ‘stable’ way of storing memories if the negative emotion is attached to periods of time rather than events, i.e. a negative emotion is present over different *periods of time* in one’s life. This study aims to investigate whether encouraging people to encode specific contexts (specific times and places) in to their memories, will make people think less globally (they are aware that different feelings are related to different events), or in a less stable manner (they realise they have felt differently over different times in their lives), or even both.

This was investigated by randomly allocating participants to either contextual or control groups. Contextual groups were encouraged to apply context to their mood and interpretations of events via a diary entry task. The contextual version of the task encouraged participants to consider that mood and interpretation of situations change over time and over events, rather than always feeling the same no matter what the situation. Control groups were not encouraged to think in such a way and were not given any contextual suggestions. By comparing the mood ratings between these groups we can see whether encouraging contextual interpretations decrease despondent mood.

Please note, the questionnaire you filled in at the beginning of the study was a measure of depressive symptoms. This was used to identify those participants who may presently be feeling a bit depressed. If you are concerned that you are feeling depressed at the moment and would like some help and advice, then please see your GP. Alternatively there are several organisations who can also provide help and advice including: the Depression Alliance (0845 123 2320 / [www.depressionalliance.org](http://www.depressionalliance.org)); The Samaritans (08457 909 090); the UCL student counselling service (020 7679 1487 / [www.ucl.ac.uk/student-counselling/](http://www.ucl.ac.uk/student-counselling/)); or you can contact Chris Brewin who is part of this project and is a qualified clinical psychologist employed by University College London (telephone 0207 679 5927; email [c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk)).

If you have any more questions about the study, or would like to be forwarded the results, please contact me at

**Appendix I: Beck Depression Inventory IA (Beck & Steer, 1993)**

ID \_\_\_\_\_ DATE \_\_\_\_\_ AGE \_\_\_\_\_ GENDER \_\_\_\_\_

Here are some statements regarding the way people feel or think. The statements are grouped in 21 sections from A to U. **One** statement must be chosen from each section. You are requested to put a circle round the number of the statement which best fits the way you have been feeling over **the past week, including today**. Be sure to read all statements in each group before making your choice.

<b>A</b>	0	I do not feel sad
	1	I feel blue or sad
	2	I am blue or sad all the time and I can't snap out of it
	3	I am so sad or unhappy that I can't stand it
<b>B</b>	0	I am not particularly pessimistic or discouraged about the future
	1	I feel discouraged about the future
	2a	I feel I have nothing to look forward to
	2b	I feel that I won't ever get over my troubles
	3	I feel that the future is hopeless and that things cannot improve
<b>C</b>	0	I do not feel like a failure
	1	I feel I have failed more than the average person
	2a	I feel I have accomplished very little that is worthwhile or that means anything
	2b	As I look back on life all I can see is a lot of failures
	3	I feel I am a complete failure as a person (parent, husband, wife)
<b>D</b>	0	I am not particularly dissatisfied
	1a	I feel bored most of the time
	1b	I don't enjoy things the way I used to
	2	I don't get satisfaction out of anything anymore
	3	I am dissatisfied with everything
<b>E</b>	0	I don't feel particularly guilty
	1	I feel bad or unworthy a good part of the time
	2a	I feel quite guilty
	2b	I feel bad or unworthy practically all the time now
	3	I feel as though I am very bad or worthless
<b>F</b>	0	I don't feel I am being punished
	1	I have a feeling that something bad may happen to me
	2	I feel I am being punished or will be punished
	3a	I feel I deserve to be punished
	3b	I want to be punished
<b>G</b>	0	I don't feel disappointed in myself
	1a	I am disappointed in myself
	1b	I don't like myself
	2a	I am disgusted with myself
	3	I hate myself

<b>H</b>	0	I don't feel I am any worse than anybody else
	1	I am critical of myself for my weaknesses or mistakes
	2	I blame myself for my faults
	3	I blame myself for everything bad that happens
<b>I</b>	0	I don't have any thoughts of harming myself
	1	I have thoughts of harming myself but I would not carry them out
	2a	I feel I would be better off dead
	2b	I feel my family would be better off if I were dead
	3a	I have definite plans about committing suicide
	3b	I would kill myself if I could
<b>J</b>	0	I don't cry any more than usual
	1	I cry more now than I used to
	2	I cry all the time now. I can't stop it
	3	I used to be able to cry but now I can't cry at all even though I want to
<b>K</b>	0	I am no more irritated now than I ever am
	1	I get annoyed or irritated more easily than I used to
	2	I feel irritated all the time
	3	I don't get irritated at all at the things that used to irritate me
<b>L</b>	0	I have not lost interest in other people
	1	I am less interested in other people now than I used to be
	2	I have lost most of my interest in other people and have little feeling for them
	3	I have lost all my interest in other people and don't care about them at all
<b>M</b>	0	I make decisions as well as ever
	1	I try to put off making decisions
	2	I have great difficulty making decisions
	3	I can't make decisions at all anymore
<b>N</b>	0	I don't feel I look any worse than I used to
	1	I am worried I am looking old or unattractive
	2	I feel that there are permanent changes in my appearance and they make me look unattractive
	3	I feel that I am ugly or repulsive looking
<b>O</b>	0	I can work about as well as before
	1a	It takes extra effort to get started at doing something
	1b	I don't work as well as I used to
	2	I have to push myself very hard to do anything
	3	I cant do any work at all
<b>P</b>	0	I can sleep as well as usual
	1	I wake up more tired in the morning than I used to
	2	I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
	3	I wake up early every day and can't get more than 5 hours sleep

<b>Q</b>	0	I don't get any more tired than usual
	1	I get tired more easily than I used to
	2	I get tired from doing anything
	3	I get too tired to do anything
<b>R</b>	0	My appetite is no worse than usual
	1	My appetite is not as good as it used to be
	2	My appetite is much worse now
	3	I have no appetite at all any more
<b>S</b>	0	I haven't lost much weight, if any, lately
	1	I have lost more than 5 pounds
	2	I have lost more than 10 pounds
	3	I have lost more than 15 pounds
I am trying to lose weight by dieting    Y    N		
<b>T</b>	0	I am no more concerned about my health than usual
	1	I am concerned about aches and pains or upset stomach or constipation
	2	I am so concerned with how or what I feel that it's hard to think of much else
	3	I am completely absorbed in what I feel
<b>U</b>	0	I have not noticed any recent changes in my interest in sex
	1	I am much less interested in sex than I used to be
	2	I am much less interested in sex now
	3	I have lost interest in sex completely



## **Appendix J: Beck Depression Inventory II (Beck, Steer & Brown, 1996a)**

Marital Status: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_  
Occupation: \_\_\_\_\_ Education: \_\_\_\_\_

**Instructions:** This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

### **1. Sadness**

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

### **2. Pessimism**

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

### **3. Past Failure**

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

### **4. Loss of Pleasure**

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

### **5. Guilty Feelings**

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

### **6. Punishment Feelings**

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

### **7. Self-Dislike**

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

### **8. Self-Criticalness**

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

### **9. Suicidal Thoughts or Wishes**


- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

### **10. Crying**

- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

Subtotal Page 1

Continued on Page 2

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**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of Interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

NOTICE: This form is printed with both blue and black ink. The black ink does not appear the way it has been printed on the original. Each of copyright 1981

Subtotal Page 2

Subtotal Page 1

Total

**Appendix K: Scramble Sentences Task used in the First SST Study**  
**(Chapter Three)**

**Please note: this is the SST used for the unstable group. The SSTs for the specific and control groups were identical, except that the unstable-contextual questions were replaced with either specific-contextual or control questions.**

Participant number: \_\_\_\_\_

**A REASONING TASK**

Rearrange each of the following sets of words to form one meaningful and correct sentence. You may not be able to use all the words but use as many words as possible. Please do not add any new words. There is usually more than one possible sentence. Please complete each sentence before moving onto the next. If a group of words ends in a question mark, the completed sentence must be a question. **ONCE YOU HAVE WRITTEN A COMPLETED SENTENCE PLEASE SAY IT ALOUD SLOWLY BEFORE MOVING ON.** Write each sentence in the space provided.

Here are some examples:

i) meal a good ate bad I  
I ate a good meal (or) I ate a bad meal

ii) my did win team lose?  
did my team win? Vs did my team lose?

Try these practice examples:

i) everybody good days bad has

\_\_\_\_\_  
ii) sun when does rise the set?

\_\_\_\_\_

**Now, try and unscramble these sentences, like the examples you tried earlier. Remember to write the sentence down and then to say it aloud slowly before moving on.**

1) often boring seems life uninteresting

---

2) I can't often bothered sometimes be

---

3) many sad I remember times various

---

4) some of a low opinion people me have many

---

5) what different views senses myself of have I do?

---

6) big mistakes made many I some have

---

7) many I bad am at some things

---

8) feeling last how long does this stay?

---

9) things about myself dislike regret I

---

10) ashamed feel things of many done I have I most

---

11) what will think about I this ten years months time in?

---

12) make little on people I impression other no

---

13) I let have others myself and down failed

---

14) mood long does any stay last how?

---

15) I things many do out wrong turn most

---

16) instant how does this one moment into fit life my whole?

---

17) future the full problems difficulties is of

---

18) miserable very feel lonely I

---

19) all my past feelings changed with time have passed?

---

20) blue feel I very down

---

21) there are that cannot be things changed

---

22) don't I states moments both have good and bad?

---

23) weaknesses aware I of faults am my

---

24) there are unresolved unsatisfactory in my life things

---

25) how important look will this moment my deathbed from appear?

---

26) there aren't many about me some things attractive very

---

27) just short one string seems the future of problems long

---

28) is I feel now how what fraction part of me?

---

29) if I really I wonder much have anything worthwhile accomplished

---

30) lack that I want some things I many

---

31) totally pessimistic the I'm future about slightly

---

32) hopeless useless I feel

---

**Appendix L: Scramble Sentences Task used in the Second and Third  
SST Studies (Chapters Four and Five)**

**Please note: this is the SST used for the control group. Unlike the SST used in the first SST study, this versions does not have any extra words added to the sentences. The SSTs for the specific and unstable groups were identical, except that the control questions were replaced with either specific- or unstable-contextual questions.**

Participant number: \_\_\_\_\_

**A REASONING TASK**

Rearrange each of the following set of words to form one meaningful and correct sentence. Please use all the words provided to make a meaningful sentence and do not add any new words. There is usually more than one possible sentence. Please complete each sentence before moving onto the next. If a group of words ends in a question mark, the completed sentence must be a question. **ONCE YOU HAVE WRITTEN A COMPLETED SENTENCE PLEASE SAY IT ALOUD SLOWLY BEFORE MOVING ON.** Write each sentence in the space provided.

Here are some examples:

i) meal a good ate I  
I ate a good meal

ii) my did team lose?  
Did my team lose?

Try these practice examples:

i) everybody days bad has

---

ii) sun when does rise the?

---

Now, try and unscramble these sentences, like the examples you tried earlier. Remember to write the sentence down and then to say it aloud slowly before moving on.

1) often boring seems life

---

2) I can't often bothered be

---

3) many sad I remember times

---

4) of a low opinion people me have many

---

5) what different photos myself of have I do?

---

6) big mistakes made many I have

---

7) many I bad am at things

---

8) weather last how long does this?

---

9) things about myself dislike I

---

10) ashamed feel things of many done I have I

---

11) what will buy with I this ten pounds?

---

12) make little on people I impression other

---



13) I let have others myself and down

---

14) weather long does any last how?

---

15) I things do out wrong turn most

---

16) how does this sofa into fit house my whole?

---

17) future the full problems is of

---

18) very feel lonely I

---

19) all my skills improved with practise have?

---

20) feel I very down

---

21) there are that cannot be things changed

---

22) don't businesses times both have good and bad?

---

23) aware I of faults am my

---

24) there are unsatisfactory in my life things

---

25) how good look will this view my window from?

---

26) there aren't many about me things attractive very

---

27) just one string seems the future of problems long

---

28) do I spend asleep now what fraction of my life?

---

29) if I really I wonder have anything worthwhile accomplished

---

30) lack that I want things I many

---

31) totally pessimistic the I'm future about

---

32) hopeless I feel

---

## **Appendix M: Diary Task Instruction and an Example of a Contextual Diary Entry**

### **A mood and language processing task**

Please read the following diary entry. Whilst reading it, you will notice that throughout the entry there are several numbered gaps which need to be filled in. For each gap, refer to the table at the bottom of the entry and look at the two choices next to the corresponding number. Your task is to choose the word or phrase where one of the words contains a vowel (A/E/I/O/U) in a capital letter in the middle of that word, and NOT the choice with a word containing a consonant in a capital letter. When you have selected the correct choice, write it in the gap provided in the diary entry.

For example, when choosing between everyday/sometimes, you would write “sometimes” as it contains a capital “E”, not “everyday”, which contains a capital “R”.

Once you have read through the diary entry and filled in all the gaps, read through it a second time adding up the number of words that contain 2 syllables. When you have added all the words together with 2 syllables, write this number in the space provided at the bottom, under the table.

Dear Diary,

I (1) \_\_\_\_\_ my job. I feel like I am not going anywhere. I joined the company (2) \_\_\_\_\_ ago, a company that I moved cities for and worked really hard to get a position at. It took me such a long time to get a job, I was about to give up. But all the effort was just a farce as (3) \_\_\_\_\_ has turned out how I thought it would. My new (4) \_\_\_\_\_ is an awful man. He often does no work – he plays golf instead (5) \_\_\_\_\_. (6) \_\_\_\_\_ I ask for his support and guidance he will not give me any. He has (7) \_\_\_\_\_ left me in a difficult situation as a result of his (8) \_\_\_\_\_, making me look incapable and stupid in front of (9) \_\_\_\_\_ my (10) \_\_\_\_\_. The (11) \_\_\_\_\_ gets me down. I don't want to go to work (12) \_\_\_\_\_, but have so much to do, resulting in me working 12 hour (13) \_\_\_\_\_. I feel extremely stressed, upset and useless (14) \_\_\_\_\_. I want to get a (15) \_\_\_\_\_ job, but I don't think I can even accomplish that as it took me such a long time to get this job. These (16) \_\_\_\_\_ make my self-esteem go even lower than it already was. I just have an absolute feeling of emptiness and loss when I think about (17) \_\_\_\_\_. I feel like a complete waster. I was told that I would do fine as I am (18) \_\_\_\_\_. However, I feel that I have wasted (19) \_\_\_\_\_ opportunities and may not achieve what I could of. I annoy myself for waking up (20) \_\_\_\_\_ and not wanting to work and wishing the (21) \_\_\_\_\_ away until the weekend arrives. I just want to remember that there is a side to me that (22) \_\_\_\_\_ see and I don't.

(1) hate / love	(12) ever again / at the moment
(2) six months / one year	(13) days / shifts
(3) nothing / this job	(14) all the time / when at work
(4) manager / boss	(15) new / better
(5) everyday / occasionally	(16) feelings / thoughts
(6) whenever / sometimes when	(17) anything / my job
(7) often / once	(18) intelligent / innovative
(8) inaction / irresponsibility	(19) so many / some
(9) all of / two of	(20) every morning / some mornings
(10) colleagues / clients	(21) days / hours
(11) whole thing / current situation	(22) others / people

Carefully re-read the passage and record the number of words containing 2 syllables: \_\_\_\_\_

### Appendix N: Example of a Control Diary Entry

Dear Diary,

I (1) \_\_\_\_\_ my job. I feel like I am not going anywhere. I joined the company (2) \_\_\_\_\_ ago, a company that I moved cities for and worked really hard to get a position at. It took me such a long time to get a job, I was about to give up. But all the effort was just a farce as it has not (3) \_\_\_\_\_ how I thought it would. My new (4) \_\_\_\_\_ is an awful man. He often does no work – he plays golf instead (5) \_\_\_\_\_. (6) \_\_\_\_\_ I ask for his support and guidance he will not give me any. He has (7) \_\_\_\_\_ left me in a difficult situation as a result of his (8) \_\_\_\_\_, making me look incapable and stupid in front of the most (9) \_\_\_\_\_ of my (10) \_\_\_\_\_. The (11) \_\_\_\_\_ of it gets me down. I don't want to go to work, I (12) \_\_\_\_\_, but have so much to do, resulting in me working 12 hour (13) \_\_\_\_\_. I feel extremely stressed, upset and useless when I (14) \_\_\_\_\_. I want to get a (15) \_\_\_\_\_ job, but I don't think I can even accomplish that as it took me such a long time to get this job. These (16) \_\_\_\_\_ make my self-esteem go even lower than it already was. I just have an absolute feeling of emptiness and (17) \_\_\_\_\_ loss as I write this. I feel like a complete waster. I was told that I would do fine as I am (18) \_\_\_\_\_. However, I feel that I have wasted (19) \_\_\_\_\_ opportunities and may not achieve what I could of. I annoy myself for waking up (20) \_\_\_\_\_ and not wanting to work and wishing the (21) \_\_\_\_\_ away until the weekend arrives. I just want to remember that there is a side to me that (22) \_\_\_\_\_ see and I don't.

(1) hate / Love	(12) fear it / dread it
(2) six months / one year	(13) days / shifts
(3) ended up / turned out	(14) talk about it / think about it
(4) manager / boss	(15) new / better
(5) everyday / occasionally	(16) feelings / thoughts
(6) when / although	(17) loss / despair
(7) inevitably / of course	(18) intelligent / innovative
(8) inaction / irresponsibility	(19) so many / some
(9) intelligent / senior	(20) early / late
(10) colleagues / clients	(21) days / hours
(11) monotony / predictability	(22) others / people

**Carefully re-read the passage and record the number of words containing two syllables: \_\_\_\_\_**

### Appendix O: Mood Scales

Participant number: \_\_\_\_\_

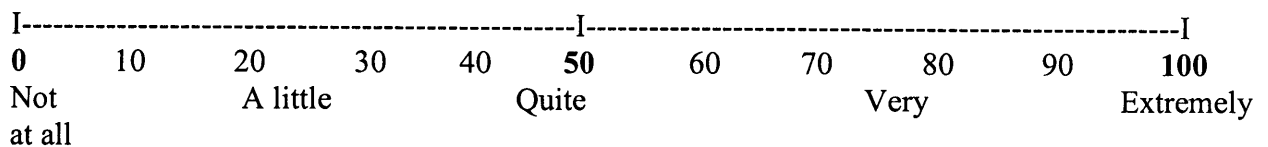
Scale number: \_\_\_\_\_

Please rate how you feel at the moment in relation to the following three emotions by writing a number between 0 and 100 that best represents how you are feeling.

'0' indicates that you *do not feel at all* ...

'100' represents that you *feel extremely* ...

The scale below should help you visualise the point that best represents your mood:



Please ask the experimenter now if you do not understand.

1. Please rate between 0 and 100 how **despondent** you feel at the moment.

'0' indicates that you *do not feel at all despondent*.

'100' represents that you *feel extremely despondent*.

I feel \_\_\_\_\_

2. Please rate between 0 and 100 how **happy** you feel at the moment.

'0' indicates that you *do not feel at all happy*.

'100' represents that you *feel extremely happy*.

I feel \_\_\_\_\_

3. Please rate between 0 and 100 how **anxious** you feel at the moment.

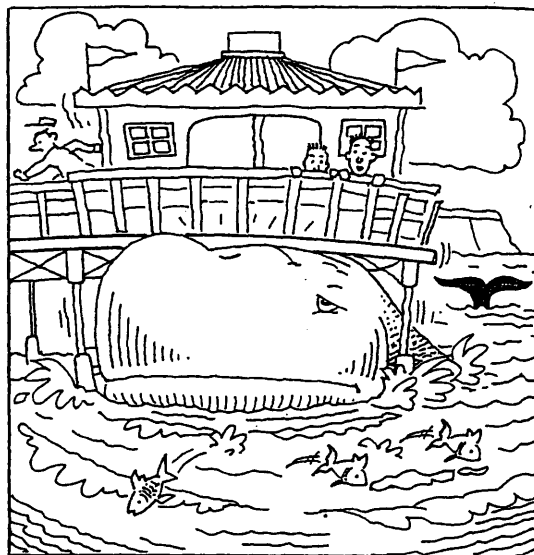
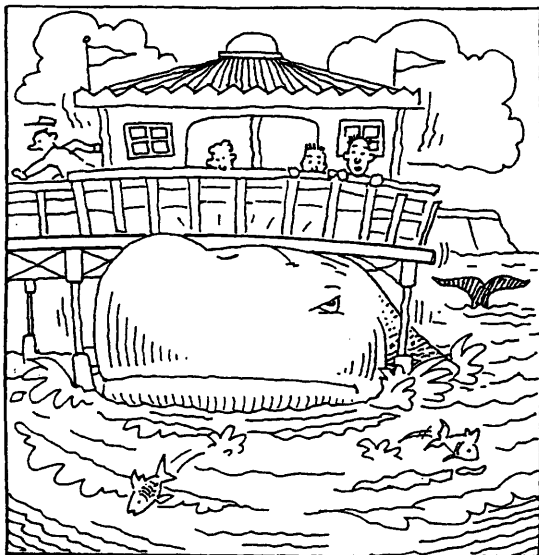
'0' indicates that you *do not feel at all anxious*.

'100' represents that you *feel extremely anxious*.

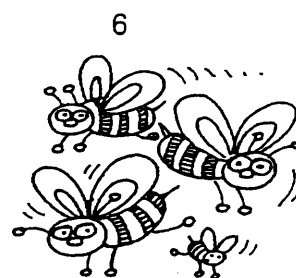
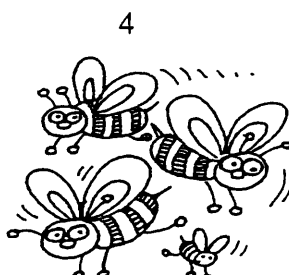
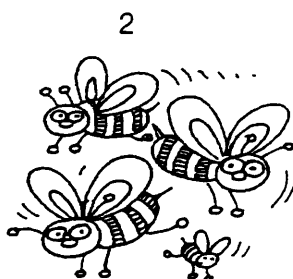
I feel \_\_\_\_\_

**Appendix P: Examples of the Puzzles Making-up the Filler Task in the  
Second Diary Study (Chapter Seven)**

There are nine differences between the two drawings – can you spot them?



Which two pictures are identical?



### **Appendix Q: Mood Reflection Task**

Imagine that you have just been told that you did not get a job that you really wanted. You thought that the interview had gone really well and that you had the right experience for the job. The job meant a lot to you as you have been searching for a job for a while now, and you were beginning to feel very discouraged as you had not been interviewed for a job up until now. Imagine that you feel upset at the news and that your confidence has been knocked.

Please rate how accurately you think the following statements reflect how you would feel if you were told that news **now**. Think about the sentences you unscrambled, and consider your mood **at the moment** when rating the statements. Rate how much each statement reflects your feelings using the scale below:

- 1 = This is exactly how I would feel.
- 2 = This is partly how I would feel.
- 3 = This is a little bit like how I would feel.
- 4 = I would not feel this way at all.

<b>Feeling</b>	<b>Rating</b>
I am not surprised I did not get the job, this always happens to me.	
Just because I didn't get the job this time, doesn't mean I won't get it next time.	
I really wanted that job, but there are other jobs out there.	
I can see that this rejection is just the beginning, I don't know if I'll ever get a job.	
This is a real knock to my confidence, but hopefully I will get a different job soon.	
When I do get a job, I will forget all about this set back.	
I never perform well in interviews, I am useless at them.	
Perhaps I can learn from that interview and go in better prepared next time.	
I feel so rejected at the moment, but hopefully I will feel better tomorrow.	
I feel like I am going to get rejected by everyone.	
This is just one set back in my life; I have to remember to take the bad things with the good things.	
I feel so inadequate at the moment; I need to remember that I don't feel like this all the time.	

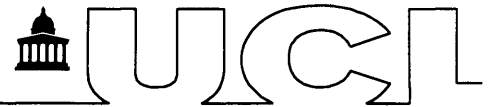


## **Appendix R: Diary Study (Chapter Seven) Continuation Booklet**

**Please note: this is the continuation booklet for the two contextual groups. The continuation booklet for the control groups was identical except that the diary entries were the control versions of the ones presented here.**

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**UCL DEPARTMENT OF PSYCHOLOGY  
SUB-DEPT OF CLINICAL HEALTH PSYCHOLOGY  
1-19 TORRINGTON PLACE  
LONDON, WC1E**



Participant number:

### **Task Continuation Pack**

#### **Instructions**

This is a task continuation booklet that contains four additional mood scales, four new diary tasks, and a mood feedback form. The mood scales and diary tasks follow the same format as the ones you completed during the experiment today.

For the next five days please complete one section at a time. Complete the first section the day after you do the study with the experimenter. Each section is separated by a sheet with the day number on. For the next five days, please fill in the sheets corresponding to the relevant day. **Please do not look at or complete all the sections in one day, make sure you only complete one section a day.**

Once you have finished the booklet, please post it back in the stamped addressed envelop supplied, or put it in the internal UCL mail. On receipt of your pack, you will be sent a debriefing sheet and a cheque.

If you have any questions or worries about the study, please contact either myself or my colleague:

#### **Principal Researcher:**

Prof. Chris Brewin  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT  
[c.brewin@ucl.ac.uk](mailto:c.brewin@ucl.ac.uk)

#### **Experimenter**

Natalie Jacoby (PhD student at UCL)  
Sub-Dept of Clinical Health Psychology  
University College London  
Gower Street, London WC1E 6BT

**Please complete one section each day for the next five days.**

## **Day 1**

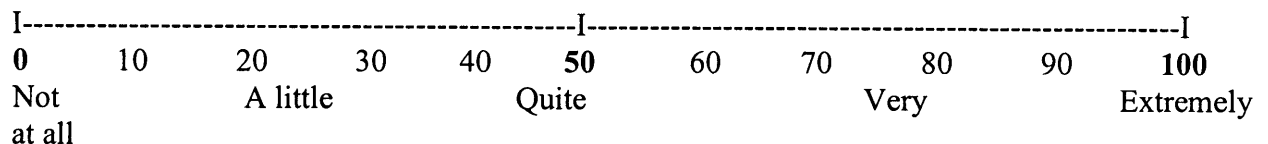
Scale number: 1

Please rate how you feel at the moment in relation to the following three moods, by writing a number between 0 and 100 that best represents how you are feeling.

'0' indicates that you *do not feel at all* ...

'100' represents that you *feel extremely* ...

The scale below should help you visualise the point that best represents your mood:



1. Please rate between 0 and 100 how **sad** you feel at the moment.

'0' indicates that you *do not feel at all sad*.

'100' represents that you *feel extremely sad*.

I feel \_\_\_\_\_

2. Please rate between 0 and 100 how **happy** you feel at the moment.

'0' indicates that you *do not feel at all happy*.

'100' represents that you *feel extremely happy*.

I feel \_\_\_\_\_

3. Please rate between 0 and 100 how **anxious** you feel at the moment.

'0' indicates that you *do not feel at all anxious*.

'100' represents that you *feel extremely anxious*.

I feel \_\_\_\_\_

Here is a reminder of how to complete the diary entries ...

Please read the following diary entry. Whilst reading it, you will notice that throughout the entry there are several numbered gaps which need to be filled in. For each gap, refer to the table at the bottom of the entry and look at the two choices next to the corresponding number. Your task is to choose the word or phrase where one of the words contains a vowel (A/E/I/O/U) in a capital letter in the middle of that word, and NOT the choice with a word containing a consonant in a capital letter. When you have selected the correct choice, write it in the gap provided in the diary entry.

For example, when choosing between everyday/sometimes, you would write “sometimes” as it contains a capital “E”, not “everyday”, which contains a capital “R”.

Once you have read through the diary entry and filled in all the gaps, read through it a second time adding up the number of words that contain 2 syllables. When you have added all the words together with 2 syllables, write this number in the space provided at the bottom, under the table.

Dear diary,

Well here I am (1)\_\_\_\_\_ years old and I am still a loser. I want to  
(2)\_\_\_\_\_ someone for (3)\_\_\_\_\_ that I have done, but I realize  
that I can't. Knowing that I am the one that has screwed myself up is disastrous. If I want to  
(4)\_\_\_\_\_ then I have to take (5)\_\_\_\_\_ for my actions. I think  
about other people like me who have (6)\_\_\_\_\_ their lives, and that gives me  
(7)\_\_\_\_\_.

I need (8)\_\_\_\_\_ amount of control in my life. My (9)\_\_\_\_\_ is  
chaotic and without (10)\_\_\_\_\_ control I would be too. I strive to be perfect in  
(11)\_\_\_\_\_, and hate that I (12)\_\_\_\_\_ screw up. I get  
(13)\_\_\_\_\_ with myself for that. I believe that if (14)\_\_\_\_\_ ever  
saw this it would mean total (15)\_\_\_\_\_. This may be an overreaction, but I  
this is how I feel (16)\_\_\_\_\_.

I don't know what my future will hold and that (17)\_\_\_\_\_ worries me. I  
have (18)\_\_\_\_\_ idea where I am headed, but I  
(19)\_\_\_\_\_ that it might be towards a life full of sadness. I'm so afraid  
that I will fail (20)\_\_\_\_\_ of the goals I try to achieve. I need to  
(21)\_\_\_\_\_ rationally. I need to take things one  
(22)\_\_\_\_\_ at a time.

(1) twenty-five / twenty-one	(12) constantly / occasionally
(2) blame/ hate	(13) angry / frustrated
(3) everything / some things	(14) anyone / my boss
(4) stay like this / change	(15) disaster / failure
(5) responsibility / charge	(16) every time / sometimes
(6) not changed / transformed	(17) continually / occasionally
(7) hope / confidence	(18) no / some
(8) continual / certain	(19) fear / worry
(9) world / timetable	(20) all / one
(10) plenty of / some	(21) think / feel
(11) everything / my work	(22) step / day

**Carefully re-read the passage and record the number of words containing  
2 syllables: \_\_\_\_\_**

## Day 2

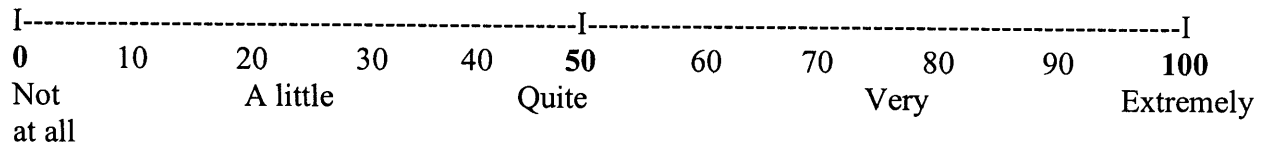
Scale number: 2

Please rate how you feel at the moment in relation to the following three moods, by writing a number between 0 and 100 that best represents how you are feeling.

'0' indicates that you *do not feel at all* ...

'100' represents that you *feel extremely* ...

The scale below should help you visualise the point that best represents your mood:



1. Please rate between 0 and 100 how **sad** you feel at the moment.

'0' indicates that you *do not feel at all sad*.

'100' represents that you *feel extremely sad*.

I feel \_\_\_\_\_

2. Please rate between 0 and 100 how **happy** you feel at the moment.

'0' indicates that you *do not feel at all happy*.

'100' represents that you *feel extremely happy*.

I feel \_\_\_\_\_

3. Please rate between 0 and 100 how **anxious** you feel at the moment.

'0' indicates that you *do not feel at all anxious*.

'100' represents that you *feel extremely anxious*.

I feel \_\_\_\_\_

Dear Diary,

Over the past couple of months, the guy I was involved with (1) \_\_\_\_\_ me. It made me feel really (2) \_\_\_\_\_ about myself. (3) \_\_\_\_\_ of me just wanted so much for him to (4) \_\_\_\_\_ me, that when it seemed like he didn't anymore, I didn't think I was, (5) \_\_\_\_\_, worth caring about. (6) \_\_\_\_\_ time I saw him, I (7) \_\_\_\_\_ I could see myself through his eyes, and that I was ugly, stupid, and uninteresting. It felt like there were (8) \_\_\_\_\_ when he made me feel worthless. I remember (9) \_\_\_\_\_ feeling used by him, as if what I had to give was so (10) \_\_\_\_\_ that he could just take it and want and need much more, and I couldn't imagine what I could (11) \_\_\_\_\_ to make myself worth his while. I thought that the strength of my wanting him could make him care for me, but it didn't happen. Everything else (12) \_\_\_\_\_ seemed pointless if I couldn't get him to care for me. Why would I bother with (13) \_\_\_\_\_ if nothing makes any difference? I was sad and lonely and depressed, and (14) \_\_\_\_\_, I just went to bed straight after work. I wasted (15) \_\_\_\_\_ of my fleeting university experience to obsess and demean myself for someone who didn't see anything special in me.

I notice times where I feel anxious and lonely (16) \_\_\_\_\_. I don't want to leave my room. I resign myself to work and grow more and more isolated as I (17) \_\_\_\_\_ others going out. I can't communicate with people (18) \_\_\_\_\_. I try to make connections with people but they (19) \_\_\_\_\_ seem to shy away from my understanding. I want and (20) \_\_\_\_\_ to be open with people again. I feel apprehensive and (21) \_\_\_\_\_. I do not want to be with me. I want to be like the old me I (22) \_\_\_\_\_.

(1) cheated on / left	(12) in my life / with regards to him
(2) bad / unhappy	(13) anything / this relationship
(3) the whole / part	(14) every night / on a few occasions
(4) care about / need	(15) a whole year / days
(5) ever / at that moment	(16) the whole day / for an instant.
(6) every / next	(17) hear / notice
(7) imagined / pretended	(18) anymore / at the moment
(8) countless times / certain times	(19) all / sometimes
(9) constantly / one particular time	(20) need / try
(10) little / insignificant	(21) alone / deserted
(11) do / Say	(22) remember / recall

Carefully re-read the passage and record the number of words containing 2 syllables: \_\_\_\_\_

## Day 3

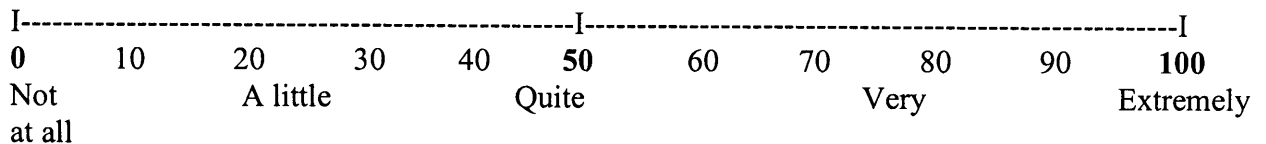
Scale number: 3

Please rate how you feel at the moment in relation to the following three moods, by writing a number between 0 and 100 that best represents how you are feeling.

'0' indicates that you *do not feel at all* ...

'100' represents that you *feel extremely* ...

The scale below should help you visualise the point that best represents your mood:



1. Please rate between 0 and 100 how **sad** you feel at the moment.

'0' indicates that you *do not feel at all sad*.

'100' represents that you *feel extremely sad*.

I feel \_\_\_\_\_

2. Please rate between 0 and 100 how **happy** you feel at the moment.

'0' indicates that you *do not feel at all happy*.

'100' represents that you *feel extremely happy*.

I feel \_\_\_\_\_

3. Please rate between 0 and 100 how **anxious** you feel at the moment.

'0' indicates that you *do not feel at all anxious*.

'100' represents that you *feel extremely anxious*.

I feel \_\_\_\_\_

Dear Diary,

I am half-way through my (1) \_\_\_\_\_ at university, and all the staying up late, trying to make friends and adapting to complete independence is finally catching-up with me. I have experienced (2) \_\_\_\_\_ changes lately, (3) \_\_\_\_\_, it's (4) \_\_\_\_\_. This has certainly been the case with the "friends" I have been making. I am finding that (5) \_\_\_\_\_ I have met are really superficial and fake, and only care about their own (6) \_\_\_\_\_, and not whether they disappoint you. But I must remember that (7) \_\_\_\_\_ is like this. On top of this, I have had a really (8) \_\_\_\_\_ the last two weeks, and as a result have missed two big deadlines, along with all the (9) \_\_\_\_\_ I couldn't attend. Lately my marks have been steadily falling, and I am getting more and more lost, just (10) \_\_\_\_\_. But this is not sixth form, my situation (11) \_\_\_\_\_. I will (12) \_\_\_\_\_, and I will be able to catch up with my work over the coming (13) \_\_\_\_\_. I am just so disappointed in my self (14) \_\_\_\_\_. I feel like the more I learn, the less I know. I feel like a very tiny creature in a (15) \_\_\_\_\_ where I hardly know anything. Although (16) \_\_\_\_\_ of myself (17) \_\_\_\_\_, it is just very hard to see (18) \_\_\_\_\_ the despair, sadness and confusion I (19) \_\_\_\_\_ feel, as I lose all my confidence in everything. Maybe this is not the end of the world, but at (20) \_\_\_\_\_, I just cannot see any (21) \_\_\_\_\_ in my future. I must remember the positive (22) \_\_\_\_\_ too. Although I am finding my work hard, my other circumstances are good. I have (23) \_\_\_\_\_ to this new-found independence quickly and easily, and I have made some new friends. The work is hard, but (24) \_\_\_\_\_ I will (25) \_\_\_\_\_ back on this and feel proud that I got through it.

(1) first year / second term	(14) just like always / at the moment
(2) many / lots of	(15) place / world
(3) none good / good and bad	(16) this view / my view
(4) always the same / changing over time	(17) does not change / will not last forever
(5) the people / others	(18) past / through
(6) benefits / gains	(19) constantly / presently
(7) everyone I know / not everyone	(20) no time / the moment
(8) bad cold / upset stomach	(21) success / happiness
(9) lectures / presentations	(22) things / side
(10) I always am / in sixth form	(23) adapted / settled in
(11) never changes / has changed	(24) tomorrow / next year
(12) never feel better / feel better soon	(25) reflect / look
(13) weeks / months	

Carefully re-read the passage and record the number of words containing 2 syllables: \_\_\_\_\_



## Day 4

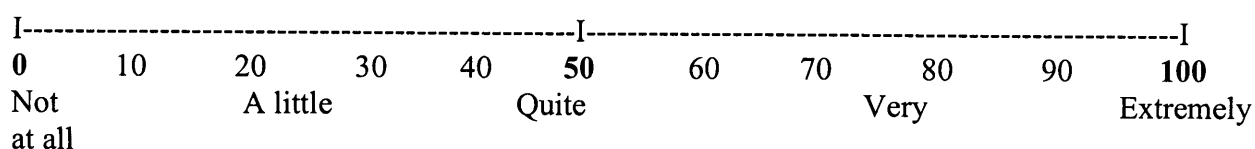
Scale number: 4

Please rate how you feel at the moment in relation to the following three moods, by writing a number between 0 and 100 that best represents how you are feeling.

'0' indicates that you *do not feel at all* ...

'100' represents that you *feel extremely* ...

The scale below should help you visualise the point that best represents your mood:



1. Please rate between 0 and 100 how **sad** you feel at the moment.

'0' indicates that you *do not feel at all sad*.

'100' represents that you *feel extremely sad*.

I feel \_\_\_\_\_

2. Please rate between 0 and 100 how **happy** you feel at the moment.

'0' indicates that you *do not feel at all happy*.

'100' represents that you *feel extremely happy*.

I feel \_\_\_\_\_

3. Please rate between 0 and 100 how **anxious** you feel at the moment.

'0' indicates that you *do not feel at all anxious*.

'100' represents that you *feel extremely anxious*.

I feel \_\_\_\_\_

Dear diary,

I don't feel (1)\_\_\_\_\_. I don't (2)\_\_\_\_\_ the last time I felt normal. I have this (3)\_\_\_\_\_ unsettled feeling (4)\_\_\_\_\_ my body. I (5)\_\_\_\_\_ have any appetite and I can't be (6)\_\_\_\_\_ with my appearance (7)\_\_\_\_\_. I don't know (8)\_\_\_\_\_ I feel like this. I think I am sick with worry. This (9)\_\_\_\_\_ feeling of anxiety makes me so tired; I am so tired I feel faint. Yet I lie down and I (10)\_\_\_\_\_ fall asleep. I'm starting to really worry about my finances, too. They seem to have gotten (11)\_\_\_\_\_ out of hand what with (12)\_\_\_\_\_ fees and rent. I (13)\_\_\_\_\_ ask my parents for money, but I fear I'm going to have to after this month. I hate it. I've (14)\_\_\_\_\_ been so independent, I feel like I have let (15)\_\_\_\_\_ down. How could I be so (16)\_\_\_\_\_?

My mind is (17)\_\_\_\_\_ filled with anxious thoughts, which cause me to flip-out over (18)\_\_\_\_\_. For example, my housemates have been really annoying me, as I keep finding the (19)\_\_\_\_\_ in a complete mess. (20)\_\_\_\_\_ when I went in there to make my dinner (21)\_\_\_\_\_ were dirty and I had to wash them up before I could start cooking. Instead of just speaking to them about it, I lost control and got hysterical. I need to calm down. Perhaps I just need a (22)\_\_\_\_\_.

(1) well / happy	(12) university / college
(2) remember / recall	(13) never / hardly ever
(3) persistent / sporadic	(14) always / recently
(4) all over / in parts of	(15) everyone / mum & dad
(5) never / rarely	(16) careless / irresponsible
(6) bothered / concerned	(17) permanently / temporarily
(7) ever / today	(18) everything / particular things
(8) why / how	(19) kitchen / bathroom
(9) persistent / occasional	(20) everyday be / yesterday
(10) can never / take a while to	(21) everything / several saucepans
(11) irreversibly / momentarily	(22) break / holiday

Carefully re-read the passage and record the number of words containing 2 syllables: \_\_\_\_\_

## Day 5

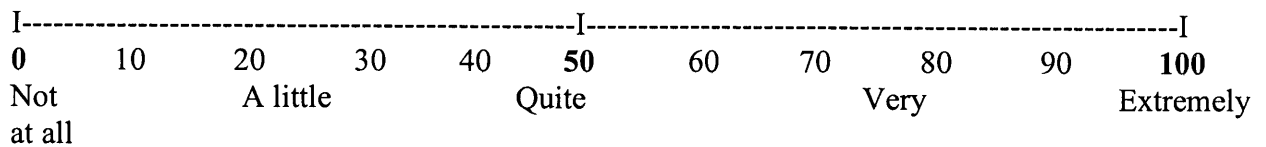
Scale number: 5

Please rate how you feel at the moment in relation to the following three moods, by writing a number between 0 and 100 that best represents how you are feeling.

'0' indicates that you *do not feel at all* ...

'100' represents that you *feel extremely* ...

The scale below should help you visualise the point that best represents your mood:



1. Please rate between 0 and 100 how **sad** you feel at the moment.

'0' indicates that you *do not feel at all sad*.

'100' represents that you *feel extremely sad*.

I feel \_\_\_\_\_

2. Please rate between 0 and 100 how **happy** you feel at the moment.

'0' indicates that you *do not feel at all happy*.

'100' represents that you *feel extremely happy*.

I feel \_\_\_\_\_

3. Please rate between 0 and 100 how **anxious** you feel at the moment.

'0' indicates that you *do not feel at all anxious*.

'100' represents that you *feel extremely anxious*.

I feel \_\_\_\_\_

### **Mood Reflection Form**

1. How have you felt this week in comparison to an average week? (Please tick one)

- Same as usual ☐
- Slightly better than usual ☐
- A lot better than usual ☐
- Slightly worse than usual ☐
- A lot worse than usual ☐

2. Has anything particularly good or bad happened this week that has affected your mood?

**Yes / No** (please circle)

If “yes”, what has happened?

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3. Did you notice any patterns in the diary task?

**Yes / No** (please circle)

If “yes”, what were these patterns?

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4. If you noticed patterns, do you think they affected your mood or how you thought about your mood? (Please elaborate)

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**Thank you for your participation and perseverance. Please post this booklet back to the experimenter using the stamped addressed envelop provided. Please print your address below so that we can send you your payment and a debriefing information sheet that tells you more about the study.**

**Many thanks.**

**Name and address:**

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